

Taxonomic notes on South African marine Mollusca (5):* including descriptions of new taxa of Rissoidae, Cerithiidae, Tonnidae, Cassididae, Buccinidae, Fascioliariidae, Turbinellidae, Turridae, Architectonicidae, Epitoniidae, Limidae and Thraciidae

by

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SYNOPSIS

New species: *Rissopsis ligula* (Rissoidae); *Plesiotrochus paucicostatus* (Cerithiidae); *Oocorys keyteri* (Tonnidae); *Metula boswellae* (Buccinidae); *Latirus elsiae*, *L. tigroides* (Fascioliariidae); *Ptychotractus youngi* (Turbinellidae); *Turris tanyspira* (Turridae); *Heliacus (Mangonua) rotula* (Architectonicidae); *Opalia terebralioides*, *Alora rapunculus* (Epitoniidae); *Limatula vermicola* (Limidae); *Thracia anchoralis* (Thraciidae).

New subspecies: *Phalium glabratum fernandesi* (Cassididae); *Gemmula congener webberae* (Turridae).

New synonyms: *Cerithium liratula* W. H. Turton, 1932, and *Nassa rhysonopia* Barnard, 1969 = *Seilopsis peilei* (E. A. Smith, 1910) (Cerithiidae); *Acamptochetus* Cossman, 1901, *Antemetula* Rehder, 1943, and *Colubrarina* Kuroda & Habe, 1971 = *Metula* H. & A. Adams, 1853 (Buccinidae); *Avicula vexillum* Reeve, 1858 = *Electroma physoides* (Lamarck, 1819) (Pteriidae); *Tellina papyracea* Spengler, 1798 (non Gmelin, 1791), *T. truncata* Philippi, 1843 (non Linn., 1767), and *T. praerupta* Salisbury, 1934 = *Psammotreta gubernaculum* (Hanley, 1844).

New names: *Metula knudseni* nom. nov. for *Buccinum clathratum* Adams & Reeve, 1850, non Kiener, 1834 (Buccinidae).

New combination: '*Fasciolaria*' *holcophorus* Barnard, 1959, belongs to the genus *Metzgeria* (Turbinellidae).

Revised status: *Columbella filmerae* Sowerby, 1900, a subspecies of *Pyrene flava* (Bruguière, 1789).

New records: *Minolia variegata* Odhner, 1919 (Trochidae), *Oocorys sulcata* Fischer, 1883 (Tonnidae), *Latiaxis lischkeanus* (Dunker, 1882) (Magilidae), *Latirus formosior* Melvill, 1891 (Fascioliariidae), *Gari burnupi* (Sowerby, 1894) (Psammobiidae), *Pteria savignyi* (Deshayes, 1830) (Pteriidae), are recorded from Moçambique for the first time, *Distorsio perdistorta* Fulton, 1938 (Cymatiidae), and *Psammotreta gubernaculum* (Hanley, 1844) (Tellinidae) from Natal, and *Pteria tortirostris* (Dunker, 1848) (Pteriidae) and *Glycymeris maskatensis* (Melvill, 1897) (Glycymeridae) from both Moçambique and South Africa.

Other: A brief cladistic analysis of subspeciation in *Phalium glabratum* (Dunker, 1852) (Cassididae) and a discussion of the *Pyrene flava* (Bruguière, 1789) complex (Columbellidae) in southern Africa, are included. *Seilopsis* Tomlin, 1931, is transferred from the Cerithiopsidae to the Cerithiidae.

In the present paper, as in others in this series, 'South Africa' has been interpreted biogeographically rather than politically, so as to include not only the Republic of South Africa and South West Africa, but Moçambique as far north as the Bight of Sofala. Furthermore some extralimital species from northern Moçambique have also been included where relevant.

The abbreviation 'N.M.' indicates the Natal Museum.

GASTROPODA

Family Trochidae

Minolia variegata Odhner, 1919 (Fig. 1)

Minolia variegata Odhner, 1919: 32, pl. 2, figs 26-28.

Locality records: Tamatave, Malagasy Republic (type locality), Bazaruto Island, Moçambique (N.M.: Mrs N. Cumming).

Odhner's excellent description and figures permit easy recognition of the species.

* Part 1, *Ann. Cape Prov. Mus. (Nat. Hist.)* 8 (4): 39-48, 1970. Part 2, *Ann. Natal Mus.* 21 (2): 391-437, 1972. Part 3, *Ann. Natal Mus.* 22 (1): 187-220, 1974. Part 4, *Ann. Natal Mus.* 22 (1): 335-348, 1974.

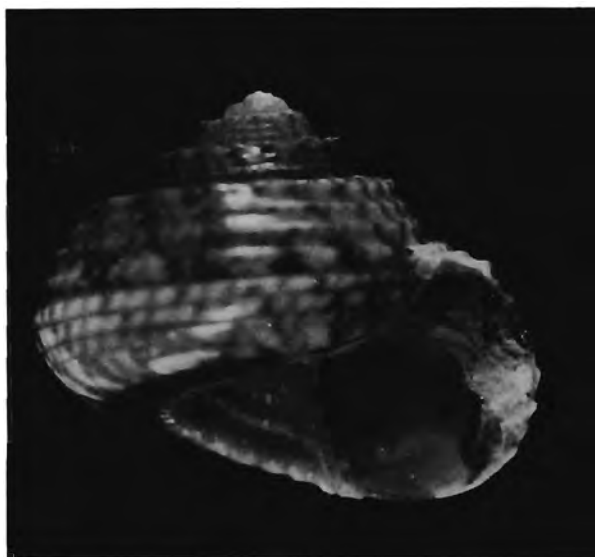


Fig. 1. *Minolia variegata* Odhner. Bazaruto I., 4,8 × 6 mm.

Family Rissoidae

***Rissopsis ligula* sp. nov. (Fig. 2)**

Diagnosis: Elongate-cylindrical, pupoid, with expanded, trigonal aperture; apex blunt; length 10 mm; smooth, white.

Description: Elongate-cylindrical, spire blunt, cyrtconic, aperture expanded, trigonal, base somewhat flattened. Total number of whorls six. Apex broadly domed, protoconch depressed, limits not apparent. Teleoconch whorls increasing rapidly in length, but barely in width, creating a pupiform appearance; whorls initially convex, but becoming progressively more flattened; sutures only slightly indented, bordered by a milky, translucent band. Surface smooth, apart from very fine growth lines; shell opaque white, moderately solid. Peristome continuous, labrum sinuous in lateral view like that of a eulimid, slightly thickened, projecting out of plane of spire, but declivously convex so that greatest width of aperture is almost at its base; labium with a rather thick white callus deposit which has a well-defined margin, labial edge flat in the parietal region, slightly concave basally.

Dimensions: 10 × 3,1 mm; 9,3 × 3,4 mm (holotype).

Distribution: Known only from the type locality, Durban Bay, in shallowly dredged sand.

Type material: Holotype (N.M. A1571/T1852); paratypes 1–3 N.M. A1572/T1853, paratype 4 in coll. B. J. Young; all leg. B. J. Young.

Remarks: *Rissopsis ligula* is very closely allied to the tropical Pacific *R. typica* Garrett, 1873, type-species of the genus, but differs in being proportionally shorter, not translucent, with more convex whorls and a more projecting lip; *R. typica* has recently been refigured by Ponder (1974: text-fig. 1). It is also closely allied to *Rissopsis alphasiboei* (Melvill, 1912) from the Persian Gulf, but is much less acuminate, with



Fig. 2. *Rissopsis ligula* sp. nov. Holotype, 0,3 × 3,4 mm.

fewer whorls, a slightly less curved columella, and no trace of spiral striae. *Pelecydion venustulum* Fischer, in De Folin & Périer, 1872, from the Sunda Straits, is also somewhat similar, but agrees better with *R. alpesiboei* in general characters, differing from both this and *R. ligula* in its peculiarly projecting, reniform aperture. The Cape *Epigrus crawfordi* (E. A. Smith, 1891) (in part *Rissoa crawfordi* of Barnard, 1963: 181) is smaller, with an oval aperture. *Epigrus cylindraceus* (Tenison-Woods, 1878) from Tasmania is smaller, less cylindrical and has a proportionally smaller aperture.

Family Cerithiidae

***Plesiotrochus paucicostatus* sp. nov. (Fig. 3a)**

Diagnosis: Spire high, whorls with irregular, widely spaced axial ribs (5–7 in number) and a strong spiral keel just above the suture, body whorl with an additional basal keel (sometimes two); whole surface with fine spiral lirae; colour off-white, rarely streaked with brown.

Description: Shape elongate-trochoid, aperture 0,34–0,40 of total length; spire whorls somewhat pagodiform due to the presence of a strong spiral keel just above the suture, and body whorl rendered bicarinate by a second, weaker keel, commencing at the level of the point of suture of the labrum; there is sometimes a third, much weaker cord, level with the junction between columella and paries. Coarse, varicoid

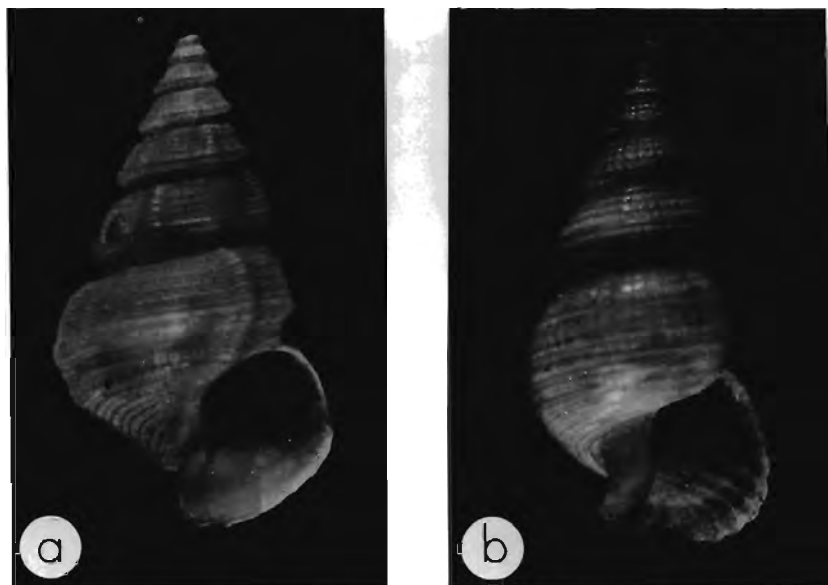


Fig. 3. a, *Plesiotrochus paucicostatus* sp. nov. Holotype, $7,5 \times 4,4$ mm. b, *Seilopsis peilei* (E. A. Smith), Port Alfred, $8,5 \times 4,3$ mm.

axial ribs develop from about the 5th whorl; these are widely and very irregularly spaced, 5–7 in number, extending from suture to suture on spire whorls and reaching to the base on the body whorl. Entire surface covered by fine spiral lirae, pricked by fine, pliculate growth lines; above the peripheral keel these lirae number 10–14 on the penultimate whorl, with an occasional weaker intermediary; just below the keel these lirae are often finer, and those on the base of the body whorl are somewhat more widely spaced. Base imperforate, aperture pyriform in shape, siphonal canal short, widely open and oblique, without a siphonal notch; base of columella spirally twisted: labial callus absent, labrum with a broad, shallow turrid-type anal sinus. Colour off-white, very rarely flecked and streaked with brown. A total of nine whorls, protoconch worn in all type specimens.

Dimensions: $6,5 \times 4$ mm; $7,5 \times 4,4$ mm (holotype); $8,8 \times 4$ mm.

Distribution: Moçambique Island to Durban Bay.

Type material: Holotype N.M. A1567/T1848, Durban Bay, shallow dredgings, leg. B. J. Young. Paratypes 1–4, N.M. A1568/T1849 and paratypes 12, 13 in coll. B. J. Young, same data. Paratype 14, N.M. G2709/T1847 Moçambique Island, leg. R.K. Discussion: *Plesiotrochus paucicostatus* is very closely allied to *P. acutangulus* (Yokoyama, 1924) from Japan, *P. ceylonicus* Sowerby, 1915, from Sri Lanka, and *P. pagodiformis* Hedley, 1907, from Queensland. It differs from the first in its fewer and decidedly irregular axial ribs, from the second in its much higher spire (aperture 0,34–0,40 of total length instead of 0,48), more angular whorls, more pointed base and narrower siphonal canal, and from the last in the presence of only a single keel on the spire (in *P. pagodiformis* the second body keel is visible at the suture on the spire whorls, giving them a basally channelled appearance).

This is the first member of the genus to be reported from southern Africa.

Seilopsis peilei (E. A. Smith, 1910) (Fig. 3b)

Cerithiopsis? peilei E. A. Smith, 1910: 196, pl. 7, fig. 9, 9a.

Seilopsis peilei; Tomlin, 1931: 424.

Cerithium liracula W. H. Turton, 1932: 126, pl. 27, fig. 914. *syn. nov.*

Nassa rhysonopia Barnard, 1969: 627, fig. 15a. *syn. nov.*

Locality records: Port Elizabeth (type locality); Port Alfred (Turton; N.M.: R.K.), East London, 20 fathoms, off Cape Recife, 67 fathoms, off Cape Infanta, 46 fathoms, and off Gericke Point, Knysna area, 46 fathoms (Barnard, 1969; juveniles).

The fresh N.M. example of this species clearly shows Barnard's *Nassa rhysonopia* to be based on juvenile specimens, and Turton's *Cerithium liracula* on a beach-worn shell.

The true relationships of the monotypic genus *Seilopsis* Tomlin, 1931, are obscure. It is certainly not referable to the Cerithiopsidae as originally suggested, but appears to be allied to *Plesiotrochus* Fischer, 1878, in the Cerithiidae. From that genus it differs in its axially plicate protoconch.

Family Cassididae

Phalium glabratum (Dunker, 1852), subsp. *fernandesi* nov. (fig. 5b, c, d)

Diagnosis: Main characters as in the tropical West Pacific *P. g. bulla* (Habe, 1961), but shell smoother, larger and with a markedly higher spire; typically it is also more solid, with a massive lip varix which is always slightly flattened in the middle.

Description: Ovate with a high, orthoconic spire, 0,39–0,42 of total length; sutures shallow, whorls moderately convex, not shouldered; labium covered by an extensive callus, relatively thin and adnate in the parietal region, thick with a flaring edge on the columella; labial edge of paries with a series of transverse pleats, continuing on to the columella, where they extend across to the outer edge, but are interrupted to form irregular granules; outer margin of columella shield not indented or only very shallowly so; pseudo-umbilicus very narrow. Labrum typically forming a massive varix, bordered behind by a shallow trough, and ending basally in a sharply pointed tooth; in apertural view lip is flattened for its median third, markedly so in fully adult examples; inner edge with 20–25 plicate teeth.

First teleoconch whorl with about eight spiral lirae, rendered cancellate by oblique, subequal axial riblets which form low, transverse beads; from about 4th whorl the spirals become wider, flatter and more irregular, and the axials obsolesce, so that by the penultimate whorl only shallow spiral sulci remain, save immediately below the suture where several lirae persevere; these sulci may be retained over the whole body whorl, or they may become medially obsolete; in the latter specimens the surface takes on a malleated appearance.

Protoconch normal for species, maximum diameter 1,7–1,9 mm.

Colour glossy cream or pale buff, sometimes with a faint pinkish tinge, suffused dorsally with mauve or violaceous-brown, particularly on the penultimate whorl; deeper water examples are darker, being biscuit-colour ventrally, spire and dorsum suffused with violaceous-brown; peristome callus white, back of labral varix with a series of brown transverse lines, more or less obsolete on the anterior third of the lip. Dimensions: 76,2 × 43,2 mm (holotype), 72,3 × 41,5 mm, 59,5 × 34,3 mm (paratypes).

Distribution: Southern Moçambique to Natal, from Xai Xai to Durban, in 55–150 fathoms.

Type material: Holotype (N.M. G2708/T1846), trawled off Xai Xai, Moçambique (about 25°00'S), in 100–150 m on mud, don. C. P. Fernandes; thick-shelled adult with broken fasciole. Paratypes 1 and 2, same data, in coll. C. Fernandes; paratypes 3 and 4, N.M. 9919/T1861, trawled off Durban in 150 fathoms, leg. G. Scott, one juvenile, both with broken apices.

Remarks: The systematics of the *Phalium glabratum* complex of subspecies were discussed by Abbott (1968: 142). Bearing in mind the considerable range of individual variation known to occur in some species of *Phalium*, the differences between *Phalium glabratum bulla* (Habe, 1961) and *P. g. fernandesi* are not great. However the picture created by distributional factors renders their separation desirable. Thus *P. g. fernandesi* from south-east Africa is not only widely isolated from *P. g. bulla*, which inhabits southern Japan, China and Hawaii, but the intervening area is inhabited by two well-defined subspecies, the nominate *P. g. glabratum* (Dunker, 1852) from Indonesia and the Philippines, and *P. g. angasi* (Iredale, 1917) from northern and north-eastern Australia.

A cladistic study of the complex is informative. *P. glabratum* clearly contains two sister groups (*sensu* Hennig, 1966) of subspecies. One, consisting of *glabratum* s.s. and *angasi*, shares characters such as a laterally indented columella shield, a non-striped lip varix, a blunt labral base, prickly labral teeth, and a tendency for the development of subsutural blotches. Conversely, the other group contains *bulla* and *fernandesi*, which have a non-indented columella shield, a transversely striped labrum, an acutely pointed labral base and plicate labral teeth. It is hardly likely that the characters of the latter group, shared by subspecies reproductively isolated at opposite ends of the range of the species, could be homoiological in origin. They must therefore be regarded as plesiomorphous within the species, and characters distinguishing the *glabratum-angasi* group, which is clearly of later origin, as apomorphous. It would appear that *bulla* and *fernandesi* are direct descendants of the ancestral *glabratum* lineage, which originally must have been widely spread through the Indo-West Pacific region, until evolution of *angasi* and *glabratum* s.s. in the central West Pacific Arc isolated the extreme wings of the population from each other. The evidently restricted range of *fernandesi* and the apparent absence of other members of the *glabratum* complex in the Indian Ocean suggest it to be a relict form. This suggests that *fernandesi* is probably closer in morphological characters to the ancestral form than is *bulla*, whose genotype has probably been modified by hybridization with the neighbouring *P. glabratum glabratum* (cf. Abbott, 1968).

Family Tonnidae

Oocorys keyteri sp. nov. (Fig. 4)

Diagnosis: Large (7–9 cm), *Galeodea*-like, with moderately produced siphonal canal, spire less than half length of aperture; labrum plicate; sculpture of raised spiral lirae, shoulder of later whorls sometimes with short axial plicules; colour brownish-buff. Description: Galeodeiform, spire less than half length of aperture, siphonal canal moderately produced; body whorl rather tumid, spire whorls convex, sutures narrowly

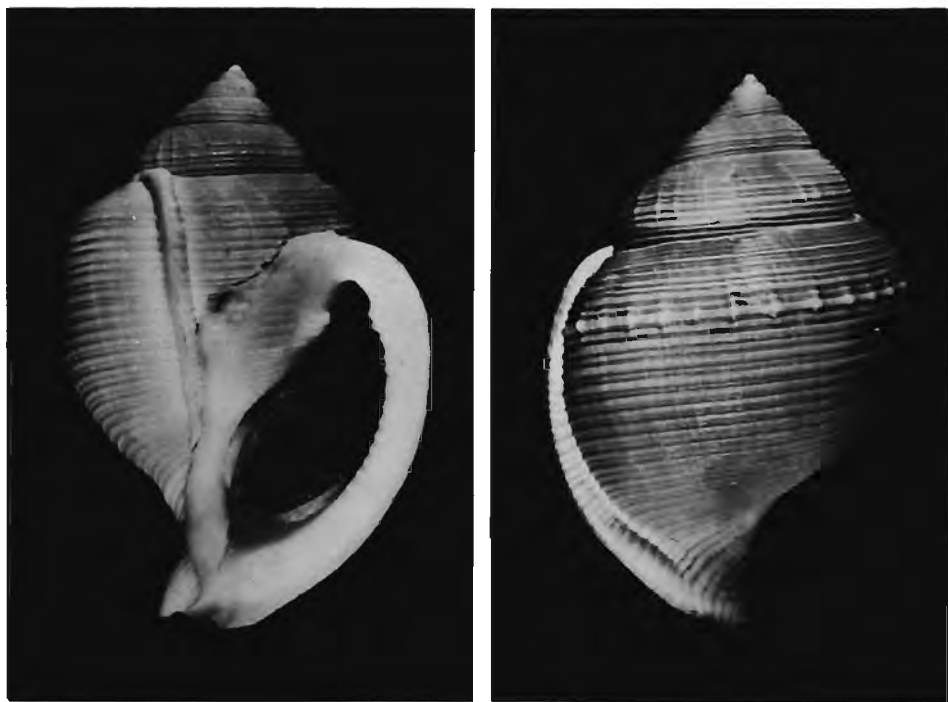


Fig. 4. *Oocorys keyteri* sp. nov. Holotype, 70,2 × 47,8 mm.

canaliculate. Labrum thickened and reflexed, crossed by 24–33 plicae ending in marginal teeth of which the posterior three or four are the strongest; labral callus continuous with the parietal shield, which is well developed but more or less transparent, and almost smooth save for a small group of short plicae situated opposite to the posterior group of labral teeth; columella callus thick, with oblique transverse ridges, edge of callus elevated, forming the merest suggestion of an umbilical rimation. Apex slightly eroded in the types, remaining whorls $7\frac{1}{2}$, this number probably including, at least one protoconch whorl. Teleoconch whorls initially sculptured by six or seven spiral lirae; these are close-set, save for a weak groove on the shoulder slope, and are crossed by fine axial riblets which may render the peripheral lirae nodular and the upper lirae undulating or even granular, but which generally obsolesce towards the lower suture; growth lines show interstitially as very fine plicules. On succeeding whorls the spirals become stronger, more numerous and more widely spaced, and the axial plicules evanesce; intermediary spiral lirae and spiral microstriae also develop in the intervals. Penultimate whorl with about 15–17 spiral lirae, subequal in width to their intervals and alternately weaker and stronger, becoming generally weaker above the periphery; below the periphery each interval bears exceedingly fine microstriae, these becoming very faint posteriorly, where the interstitial growth plicules are particularly distinct; the two interstitial sculptural elements may together form a reticulate microsculpture, particularly on the body whorl. In the holotype the penultimate whorl bears thin, somewhat irregular axial folds which become progressively

restricted to the peripheral region, and on the back of the body whorl they become very short, and in combination with one strengthened lira form about fifteen small compressed tubercles; in the paratype there is no sign of this pliculate sculpture, although a strengthened peripheral lira is present. The holotype is slightly aberrant in that the mid-apertural face of its body whorl shows a previous lip varix. Colour brownish-buff, darkest dorsally, peristome whitish.

Operculum ovate, nucleus about one-third of length from base of outer margin, inner margin sinuous.

Dimensions: 70,2 × 47,8 mm (holotype); 89,3 × 56,6 mm (paratype).

Distribution: Trawled off the Limpopo River mouth in about 235 fathoms.

Type material: Holotype N.M. G2184 (T1841), don. B. Keyter, shell with operculum; off Limpopo River, SE ca 30 miles, in about 235 fathoms; paratype, same area, in coll. C. P. Fernandes.

Remarks: In form *Oocorys keyteri* approaches most closely *O. alcocki* (E. A. Smith, 1906) from Indonesia and the Bay of Bengal, and *O. nipponica* Sakurai & Habe (in Habe, 1964: 67, pl. 20, fig. 1) from Japan; these two species, however, differ in their white colour, smooth lips and lack of parietal plicae. *O. keyteri* further differs from *alcocki* in its more elevated spiral ridges and in its lower spire. *O. nipponica* has a row of well-developed nodules on the spire, becoming obsolete on the body whorl.

Habe (1964) refers both *alcocki* and *nipponica* to the genus *Galeoocorys* Kuroda & Habe, 1957. This taxon was originally created for *Oocorys leucodoma* (Dall, 1907), *O. granulosa* (Schepman, 1909) and *O. caribbaea* Clench & Aguayo, 1939, on account of the conspicuously nodular sculpture of these species. The radula of the type-species, *O. leucodoma*, figured by Kuroda & Habe (1957: fig. 1), agrees substantially with that of *O. sulcata* Fischer, 1883, type-species of *Oocorys* Fischer, 1883 (= *Benthodolium* Verrill & Smith, 1884), as figured by Bayer 1971: fig. 20B, C), and *Galeoocorys* is best regarded merely as a subgenus of the latter taxon. However it will probably prove advisable to erect a third subgenus for *O. keyteri*, *O. alcocki*, and *O. nipponica*, and for *O. bartschi* Rehder, 1943, and *O. barbouri* Clench & Aguayo, 1939, on account of the strongly produced siphonal canal of these species, resulting in a *Galeodea*-like appearance. Turner (1948) moreover showed that the rachidian plate of *O. bartschi* lacked basal cusps such as occur in *O. sulcata* and *O. abyssorum* (Verrill & Smith, 1884). The absence of these in other members of the group should be investigated.

Oocorys sulcata Fischer, 1883 (Fig. 5a)

Oocorys sulcata Fischer, 1883: 392; *idem*, 1887: 769, fig. 536; Schepman, 1909: 120; Turner, 1948: 186, pl. 75, fig. 8, pl. 85, figs 1, 2; Nordsieck, 1968: 107, pl. 17, no. 64,00; Bayer, 1971: 142, figs 18, 19, 20 B, C, 22 B.

Oocorys sulcata var. *indica* E. A. Smith, 1906a: 170.

A single unworn shell trawled off Bazaruto Island in 300 fathoms (N.M.: Mr & Mrs R. W. Eastwood) may prove to represent an undescribed species, but cannot be separated from the Atlantic *Oocorys sulcata* until details of variation limits and distribution in that species are available. Schepman (1909) identified a juvenile from the Flores Sea (Indonesia) as *sulcata*, and the present specimen seems to agree with the figures of Fischer and of Turner, save for its slightly higher spire, more curved columella, apparently more widely spaced but slightly more numerous spiral lirae (about 40 on the last whorl instead of 26–30), and in the presence of a shallow umbilical

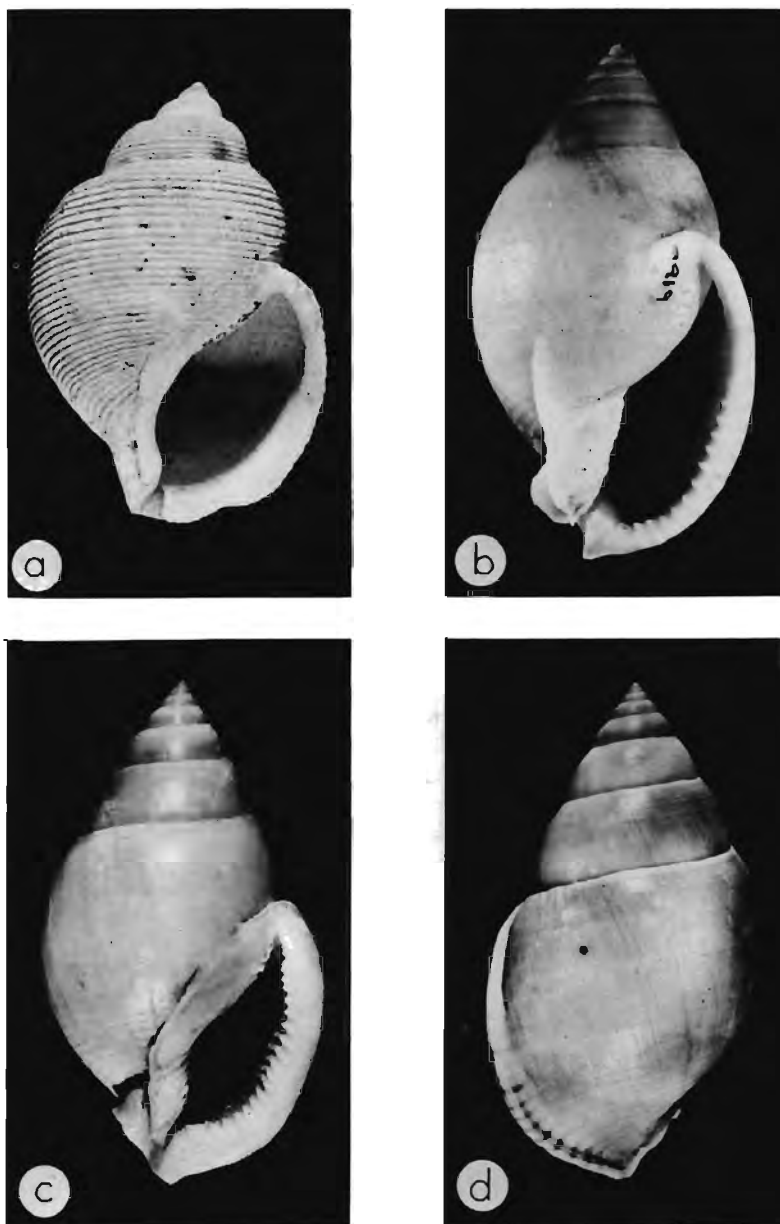


Fig. 5. a, *Oocorys* ? *sulcata* Fischer. Off Bazaruto I., 300 fathoms, 41,7 × 30 mm.
 b, *Phalium glabratum fernandesi* subsp. nov. Paratype from 150 fathoms off
 Durban, 63 × 37,2 mm. c, d, *P. g. fernandesi*. Holotype, 76,2 × 43,2 mm.

rimation. The last character may be significant, as Turner regarded such a rimation as of diagnostic value in the case of the Western Atlantic *Oocorys abyssorum* (Verrill & Smith, 1884); Smith (1906a) referred to its presence in his unfigured 'var.' *indica* from off Sri Lanka. I have, however, hesitated to refer the present specimen to *indica* on account of Smith's remarks on the resemblance of his shell to the figure given by Watson (1886: pl. 17, fig. 11). The latter figure shows a shell with a decidedly more oblong body whorl than either *O. sulcata* or the Bazaruto specimen, and was subsequently separated as a new species, *O. watsoni* Locard, 1897. To complicate the position, Bayer (1971) has figured two examples of *O. sulcata* from the Eastern and Western Atlantic with greatly differing proportions, suggesting shape to be a character of variable significance in the genus *Oocorys*.

Family Cymatiidae

Distorsio perdistorta Fulton, 1938

Distorsio perdistorta: Lewis, 1972: 34 (synonymy), figs 1-3, 5-7, 11-34.

Lewis (loc. cit.) has recorded this supposedly Japanese species not only from off north-west Malagasy, but from the tropical Western Atlantic as well. Specimens in the N.M. collection were trawled (living and dead) in 80-90 and in 120 fathoms south-east of Durban Bluff (leg. G. Scott). It is interesting to note that these examples resemble the Atlantic specimens figured by Lewis in their conspicuously pilose periostracum, rather than typical Japanese examples.

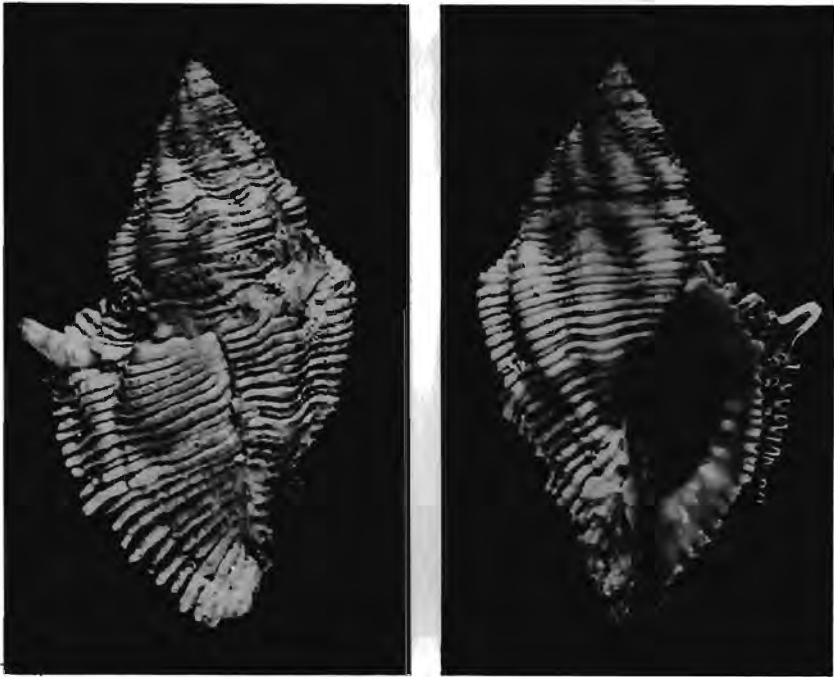


Fig. 6. *Morula coronata* (H. Adams). Durban, 24,5 × 14,9 mm.

Family Muricidae

Morula (Cronia) coronata (H. Adams, 1869) (Fig. 6)

Coralliophila coronata H. Adams, 1869: 272, pl. 19, fig. 4.

Sistrum coronatum; Sowerby, 1897: 6.

Locality records: Barkly Island, Mauritius (type locality); Durban, Natal (N.M.: W. Falcon, R.K.).

The generic position of this species will remain unsettled until the soft parts are known. The shell shows affinity on the one hand to *Coralliophila* species (Magilidae) such as *C. costularis* (Lamarck, 1816), and on the other to *Morula* spp. such as *M. biconica* (Blainville, 1832). Sculpture and apertural characters on the whole are more suggestive of the latter taxon.

In none of the available Natal specimens are the shoulder spines as prominent as in the type figure, and they are also more biconical in shape; furthermore the columella



Fig. 7. *Latiaxis lischkeanus* (Dunker). Off Inhaca I., 270 fathoms, 56,1 × 33,2 mm.

is not smooth, as described, but bears a series of small nodules. Such variation is not unprecedented within the genus *Morula*.

Family Magilidae

Latiaxis (Toreuma) lischkeanus (Dunker, 1882) (Fig. 7)

Rapana lischkeana Dunker, 1882: 43, pl. 1, figs 1, 2, pl. 13, figs 26, 27.

Latiaxis (Toreuma) lischkeanus; Kira, 1962: pl. 26, fig. 24.

Specimens trawled off southern Moçambique, about 80 km off Inhaca Island in 270 fathoms (N.M.: don. Mrs H. Boswell), do not differ appreciably from specimens from Japan. Geographic isolation of the two populations is probably more apparent than real, for *Latiaxis australis* Laseron, 1955, from New South Wales, appears to be indistinguishable from *L. lischkeanus*, and provides a geographic link.

Family Columbelloidea

Genus *Pyrene* Röding, 1798

The identities of members of the *Pyrene flava* complex have been greatly confused in the literature pertaining to the South African region. The taxa involved may be summarized as follows:

- (1) *Pyrene testudinaria* (Link, 1807); this was recorded under the name *Columbella sagena* Reeve, 1858, a synonym, by Sowerby (1892). E. A. Smith (1906: 37) showed this record to be based on *filmerae*. The true *testudinaria*, however, does occur in Moçambique.
- (2) *Pyrene punctata* (Bruguière, 1789); although this has not been recorded from southern Africa as such, Barnard (1959: 175) mentions a specimen of *obtusa* or *filmerae* misidentified by Sowerby as *splendidula* (Sowerby, 1844), a synonym of *punctata*. The true *punctata* occurs in Moçambique.
- (3) *Pyrene obtusa* (Sowerby, 1832); although correctly recorded by Sowerby (1897), this species has also been erroneously reported under various other names (see below).
- (4) *Pyrene flava* (Bruguière, 1789); recorded by Sowerby (1892), but Natal specimens so named by Ponsonby and E. A. Smith (N.M. coll.) are actually *obtusa*. *P. flava* is a well-known Indo-West Pacific species which is represented in the south-western Indian Ocean by the following taxon.
- (5) *Pyrene filmerae* (Sowerby, 1900); this is endemic to southern Africa, and is here relegated to subspecies rank within *Pyrene flava*. It is discussed further below.
- (6) *Pyrene undata* (Kiener, 1834); recorded by Krauss (1848), apparently from specimens of *obtusa*. *Columbella undata* appears to be the *Columbella tringa* of authors, non *Voluta tringa* Linnaeus, 1758, which Dodge (1955: 101) showed to be a synonym of the Mediterranean *C. rustica* (Linn., 1758). *P. undata* is evidently merely a colour variant or minor genetic form of *flava*, similar specimens occurring in the Bazaruto Island population here regarded as intermediate between *P. flava flava* and *P. flava filmerae* (see below).
- (7) *Columbella lactea* (Kiener, 1834); Krauss's 1848 record of this was undoubtedly based on the not uncommon white form of *obtusa*.

Key to species of *Pyrene* (*Pyrene* s.s.) in south-eastern Africa

1. Spire very acute, orthoconic, early whorls not carinate; aperture with greatest width at base; base and early whorls spirally striate; colour dark chestnut with numerous round white spots, some of which are grouped into subsutural blotches, aperture white; periostracum smooth, thin, close, transparent. **testudinaria**
 Spire acute to obtuse, cyrtoconic, early part coeloconic, more or less lower than in previous species, with a distinct spiral cord below the suture; aperture tapering at base; colour pattern not as in *testudinaria*, aperture normally violaceous; periostracum fibrous. (2)
2. Spire low conical, about 0,5 length of aperture, shoulder rather swollen, early whorls strongly carinate; colour dark chestnut with basal triangles and zigzag lines of white, and large subsutural blotches of that colour; periostracum thin, close, finely fibrous. **punctata**
 Spire more than 0,5 length of aperture, early whorls with a weak subsutural cord; shoulder not swollen; subsutural region without large white blotches. . . (3)
3. Periostracum finely fibrous, close, dull and translucent, with subsutural bristles; shell white with dark chestnut spots and triangles and subsutural blotches, rarely uniform white; shoulder not developed; spiral threads only present on base . . .

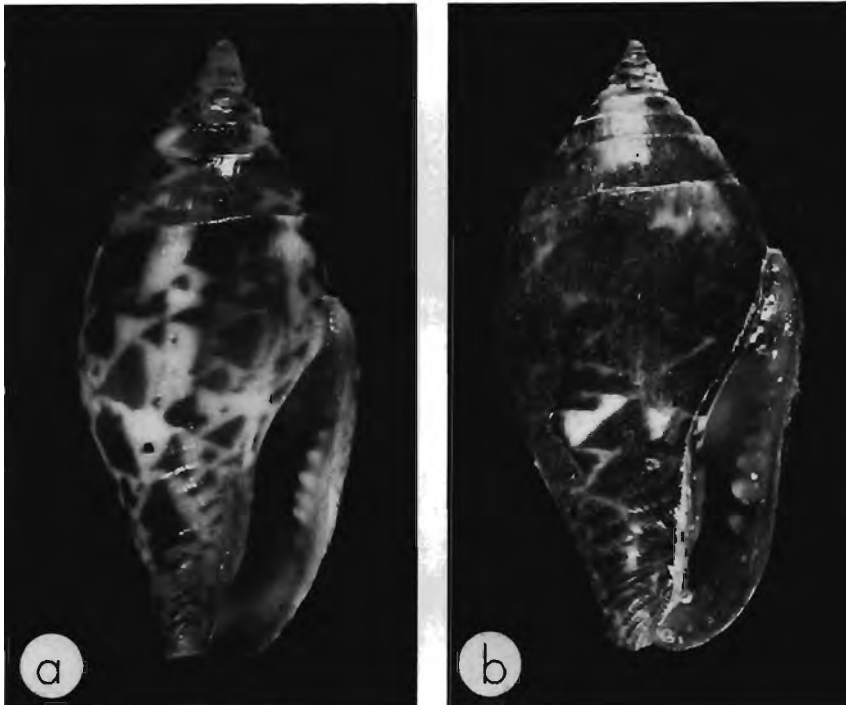
obtusa

Fig. 8. a, *Pyrene obtusa* (Sowerby). Durban, 16,4 × 7,8 mm. *b, *P. punctata* (Bruguière). Bazaruto I., 19,8 × 10,1 mm.

Periostracum coarsely fibrous and opaque, with a golden iridescence; shell rich chestnut to orange-brown, densely spotted with white, with a dark subsutural line bordered below by an orange or orange-brown zone; rarely uniform pale pink; shoulder distinct; in northern part of range colour is more variable but never as in *P. obtusa*, and most of shell is spirally sculptured. ***flava filmerae***

Pyrene obtusa (Sowerby, 1832) (Fig. 8a)

Columbella obtusa Sowerby, 1832: 117; *idem*, 1844: 120, pl. 37, figs 63, 64; Reeve, 1858: pl. 16, fig. 85; Sowerby, 1897: 10; Pace, 1902: 115.

Columbella undata (non Kiener, 1834); Krauss, 1848: 124.

Columbella lactea (non Kiener, 1834); Krauss, 1848: 124.

Columbella flava (non Bruguière, 1789); Sowerby, 1892: 22.

Columbella filmerae (partim non Sowerby); Barnard, 1959: 175, fig. 34g (radula); *idem*, 1969: 630.

Despite the confusion that has existed in South African literature specimens of this common Natal *Pyrene* agree well with figures of *obtusa* from Polynesia, and with a N.M. example from Hawaii. Dr A. C. van Bruggen has also compared specimens with South Pacific material in the British Museum (Natural History), including the probable type.

Pure white specimens occur, but otherwise the colour pattern (described above) is relatively constant. There is some variation in shape, older examples being markedly more pupoid than young ones.

South African range (N.M. coll.): Xora River mouth (Transkei) to Umhlali (Natal). Lives on the underside of rocks in low-tide pools.

The Cocos-Keeling Island specimen figured by Orr Maes (1967: pl. 119, fig. H) as *P. obtusa* agrees in colour pattern, but has a markedly higher spire; this can perhaps be ascribed to local variation.

Pyrene flava filmerae (Sowerby, 1900) **stat. rev.** (Fig. 9b-d)

Columbella filmerae Sowerby, 1900: 3, pl. 1, fig. 8.

Pyrene filmerae (partim); Barnard, 1959: 175; *idem*, 1969: 630.

Columbella sagena (non Reeve); Sowerby, 1892: 21.

Pyrene flava filmerae is distinguished from *P. obtusa* by the nature of the periostracum, colour-pattern and details of shape. Although commonly washed up on the shore with *obtusa*, it inhabits deeper water and does not appear to have been taken alive in South Africa. While the colour pattern of Transkei-Natal examples is very constant, a series of 40 specimens from Bazaruto Island (N.M.: Mrs E. Roscoe) shows a wide range of patterns, ranging from the almost typical *filmerae* state to specimens that are uniform brownish-orange, or whitish with longitudinal chestnut stripes. The latter forms are barely distinguishable from the Indo-West Pacific *Pyrene flava* (Bruguière, 1789). Spiral sculpture in these Bazaruto shells is also more marked than in typical *filmerae* and similar to that of *flava*. Certainly in this area the dividing line between the two becomes too blurred to warrant their separation at the species level, and their intermediate nature can be ascribed to hybridization along the zone of contact between two adjacent subspecies.

The radulae of Bazaruto examples agree with that of *Pyrene obtusa* (cf. Barnard, 1959: fig. 34g); the rachidian plate is semi-lunate in both species.

Range (N.M. coll.): Xora River mouth (Transkei) to Bazaruto Island (Moçam-

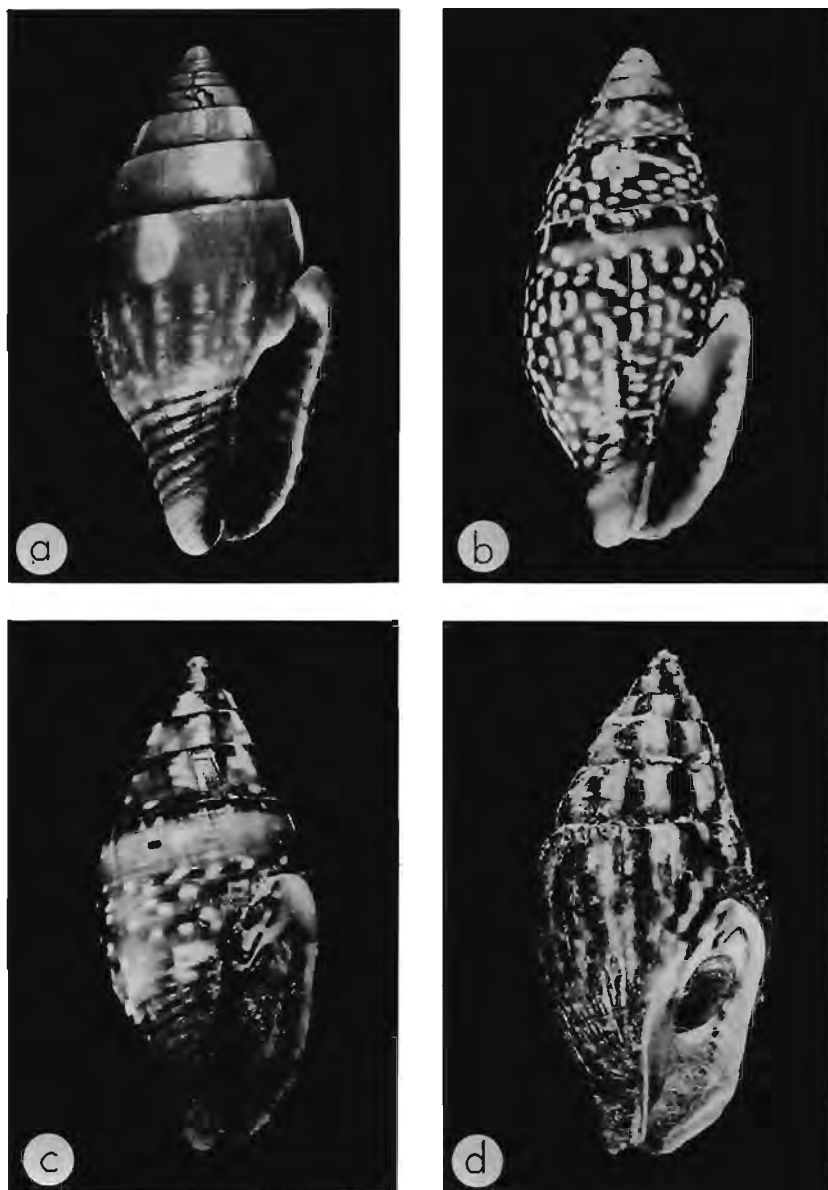


Fig. 9. a, *Pyrene flava flava* (Bruguière). Mauritius, 22 × 10,7 mm. b, *Pyrene flava filmerae* (Sowerby). Coffee Bay, Transkei, 21,2 × 9,8 mm. c, *P. flava flava* × *filmerae*. Bazaruto I., 22,2 × 10,4 mm. d, *P. flava flava* × *filmerae*, strigate form (*undata* Kiener). Bazaruto I., 23,2 × 11 mm.

bique). Sowerby's 1892 record from Port Elizabeth (as *C. sagena*) must be rejected as erroneous as it lies well outside the known range of the subspecies.

Pyrene testudinaria (Link, 1807) (Fig. 10a)

Columbella testudinaria Link, 1807: 95.

Pyrene testudinaria tylerae (Griffith & Pidgeon, 1834); Kuroda *et al.*, 1971: 157 (references and synonymy), pl. 47, figs 1, 2.

Moçambique: Bazaruto I. (N.M.: E. Roscoe, J. Dichmont), and Baia dos Cocos, near Jangamo (N.M.: A. Jenner). Widely distributed throughout the Indo-West Pacific.

Pyrene punctata (Bruguière, 1789) (Fig. 8b)

Buccinum punctatum Bruguière, 1789: 281.

Pyrene punctata; Kira, 1962: pl. 29, fig. 10.

Columbella (Conidea) discors Gmelin, 1791; Kobelt, 1892: 18 (references and synonymy), pl. 2, figs 17, 18.

Moçambique: Bazaruto I. (N.M.: Mrs E. Roscoe). Distribution similar to that of *P. testudinaria*.

Family Buccinidae

Genus *Metula* H. & A. Adams, 1853

Metula H. & A. Adams, 1853: 84. Type-species *Buccinum clathratum* Adams & Reeve, 1850 (S. D. Kobelt, 1876).

Acamptochetus Cossman, 1901: 123, Type-species *Murex mitraeformis* Brocchi, 1814 (O.D.).

Antemetula Rehder, 1943: 199. Type-species *Buccinum metula* Hinds, 1844 (O.D.).

Colubrarina Kuroda & Habe, in Kuroda, Habe & Oyama, 1971: 173. Type-species *Antemetula (Colubrarina) metulina* Kuroda & Habe, 1971 (O.D.).

The systematics of the *Metula* complex of taxa have been discussed by Rehder (1943: 199) and Cernohorsky (1971: 149). The type-species of *Metula*, *Buccinum clathratum* Adams & Reeve, 1850, is inadequately known. Although described from the Cape of Good Hope, it has never been rediscovered in these waters. Nor has a subsequent record from tropical West America been accepted by recent workers (it was probably based on the rather similar *Metula amosi* Vanatta). However Knudsen (1956: 39, pl. 1, fig. 1) has solved the problem by showing *Metula clathrata* to occur in the waters off Spanish Guinea. As *Buccinum clathratum* Adams & Reeve, 1850, is a primary junior homonym of *Buccinum clathratum* Kiener, 1834, it is considered appropriate to here rename the species ***Metula knudseni* nom. nov.**

Believing the *Metula* of authors to represent a distinct taxon, Rehder (1943) erected the genus *Antemetula*, with *Buccinum metula* Hinds, 1844, as type-species. Recently Cernohorsky (1971) has rejected this as a synonym of *Acamptochetus* Cossman, 1901, whose type-species is the Pliocene *Murex mitraeformis* Brocchi, 1814. However no differences are discernible between Knudsen's figure of *Metula knudseni*, Cernohorsky's figure of *Acamptochetus mitraeformis*, and specimens of *Antemetula metula*, other than small specific details of sculpture and proportion. On available evidence I have no hesitation in relegating *Acamptochetus* and *Antemetula* to the synonymy of *Metula*. The same applies to *Colubrarina* Kuroda & Habe, 1971, described as a subgenus of *Antemetula*, and characterized solely by the larger shell and coarser sculpture of the type-species, *A. (C.) metulina*.

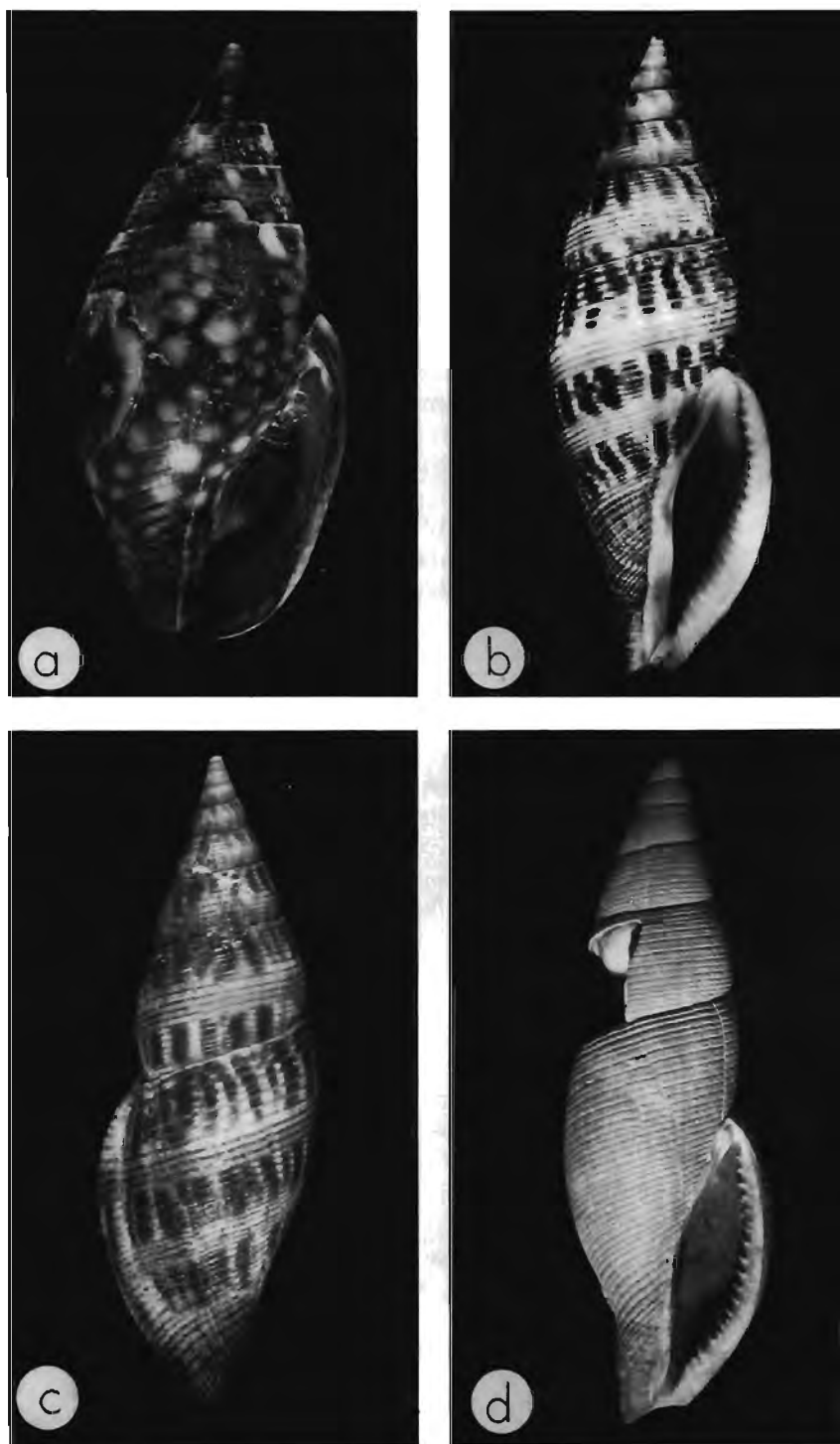


Fig. 10. a, *Pyrene testudinaria* (Link). Bazaruto I., 18,8 × 9,2 mm. b, c, *Metula boswellae* sp. nov. Holotype, 68 × 23,6 mm. d, *Metula* sp. Off Durban in 280 fathoms, 85,9 × 27,5 mm.

***Metula boswellae* sp. nov.** (Fig. 10b, c)

Diagnosis: Relatively large (about 7 cm), spire subequal to aperture; aperture narrow, tapering greatly at siphonal canal; sculpture of numerous flattish spiral ridges without axial sculpture; no varices retained on spire whorls; colour light brown with zones of chestnut-brown blotches.

Description: Fusiform, spire high (subequal in length to aperture), sharp, early part orthoconic, later cyrtoconic, body whorl scarcely exceeding the penultimate one in width; early whorls only slightly convex, subsequent whorls becoming progressively more arched, periphery of each whorl median; body whorl evenly tapered, siphonal rostrum short, truncate. Aperture narrow, acutely angled at each end; siphonal canal equal in length to about one-third of remainder of aperture, narrow, opening out terminally; labrum reinforced by a massive varix, inside of lip with 22 thin pleats; labium with a moderately thick and even callus, continuous with that of labium; edge of labial callus more or less adnate, its surface smooth, save for a vestigial parietal nodule in the posterior angle of the aperture; base of siphonal rostrum without a distinct fasciolar ridge.

Sculpture: first teleoconch whorl with ten fine, close spiral lirae, the subsequent four whorls with about nine flatter lirae, separated by narrow, sharply incised intervals; splitting of the original lirae increases their number to twelve on the 5th whorl and to twenty-two on the penultimate one; on later whorls the lirae are frequently paired, and tend to be equal to or narrower than their intervals; their flattened tops are feebly notched by growth lines. Base of body whorl with about 42 spiral ridges, those on the rostrum being more elevated than the others.

Protoconch missing, teleoconch whorls nine.

Ground colour light fawn, paler around the middle on each whorl, marked by series of large, axially oblong, dark chestnut blotches or streaks, there being three series on the body whorl, two of which are visible on the penultimate one, and one on each of the 5th to 7th whorls; earlier whorls are unpatterned and tinged with violaceous; the three series of blotches on the body whorl show on the back of the labral varix only as a few colour streaks, the main pattern being three diffuse brown bars, one terminal, the others corresponding to the intervals between the three body zones; peristome white, interior of aperture purplish-brown, the three zones showing dimly through from the exterior.

Dimensions: 68 × 23.6 mm.

Type locality: Trawled off Moçambique, exact locality and depth unknown. The solid shell and bright pattern may indicate a shallow water habitat, in which case the prawn grounds north of Beira are a likely possibility.

Type material: Holotype N.M. G2711/T1856, don. Mrs H. Boswell.

Remarks: *Metula knudseni* from West Africa, *M. amosi* Vanatta, 1913, from Panama and west Mexico, *M. metulina* (Kuroda & Habe, 1971) from Japan, *M. andamanica* Smith, 1906, from the Andaman Islands, *M. daphnelloides* Melvill & Standen, 1903, from the Gulf of Oman, *M. mitrella* (Adams & Reeve, 1850) from the Philippines and Japan, and *M. elongata* Dall, 1907, from China and Japan differ from *boswellae* in their decidedly cancellate sculpture. The West African *Metula cumingi* (A. Adams, 1853) possesses a much lower spire and well-developed axial ribs. The only comparable species is the Panamanian *Metula metula* (Hinds, 1844), which shows predominantly

spiral sculpture on the body whorl and has a somewhat similar colour pattern to *boswellae*; however its early whorls are finely cancellate, the spiral sculpture is weaker and finer, the spire proportionally lower, and overall size is much smaller than in the Moçambique species. It is interesting to note that Smith (1904: 464) recorded *Metula metula* from off India; however he appears to have confused it with *mitrella*.

An interesting specimen (fig. 10d) said to have been trawled in 280 fathoms, 16–24 km off Durban, is in the collection of Mrs Helen Boswell. While it seems to agree with *Metula boswellae* in general shape, sculpture and apertural characters, it is much larger (length 85,9 mm), the base is less tapering and the periphery of the body whorl more flattened. Unfortunately the specimen is chalky and badly broken, so that its relationships must remain an open question.

The present species is named in honour of Mrs Boswell.

Family Fasciolaridae

Latirus elsiae sp. nov. (Fig. 11a, b)

Diagnosis: Fusiform with a high spire and moderately long, narrow canal; sculptured by strong, gently rounded axial ribs, seven on body whorl, and fine, close spiral lirae; colour flesh, ribs and rostrum with brown marks.

Description: Fusiform, spire almost equal in length to rest of shell, sharp, orthoconic; sutures deep, whorls strongly convex, particularly the last and penultimate ones, periphery just below middle on early whorls, slightly above it on penultimate one; siphonal rostrum long, narrow, slightly twisted, umbilicus absent, but columella callus bordered by a shallow groove; fasciolar ridge low and rounded, siphonal canal subequal in length to rest of aperture. Labial callus moderately thick, edge adnate in parietal region, slightly free along columella; base of columella with four weak pleats, of which the anteriormost is the strongest, and there is a weak parietal ridge in the posterior angle of the aperture. Aperture ovate, interior of labrum with fourteen thin spiral ridges each of which breaks up into a series of granules near the lip.

Sculpture of thick, gently rounded axial ribs, somewhat wider than their intervals, on spire whorls extending from suture to suture, somewhat flattened below suture; on body whorl these ribs evanesce at the base of the siphonal rostrum; ribs rather sharp on first teleoconch whorl, eleven in number, decreasing to nine on the 2nd whorl, and to seven on the 4th and succeeding whorls; the very last rib is somewhat varicoid. Spiral sculpture consists of fine, close spiral lirae which cross the ribs; these number about five on the 1st teleoconch whorl, increasing to about twenty-six on the penultimate whorl, plus finer intermediaries, some of which run along the crests of the main lirae; lirae rather widely spaced on base, body whorl with a total of about eighty main lirae; intervals show rather pliculate growth lines.

Colour pale flesh, base tinged with purplish-brown, crests of ribs with a series of axial brown spots on the shoulder slope, and another around middle of body whorl (showing in places above suture on spire whorls), base of siphonal rostrum with a third series of brown streaks; aperture and labial callus pinkish-white.

Dimensions: 51,4 × 19,8 mm.

Distribution: Known only from the type locality, north of Beira, Moçambique, in 10–20 fathoms.

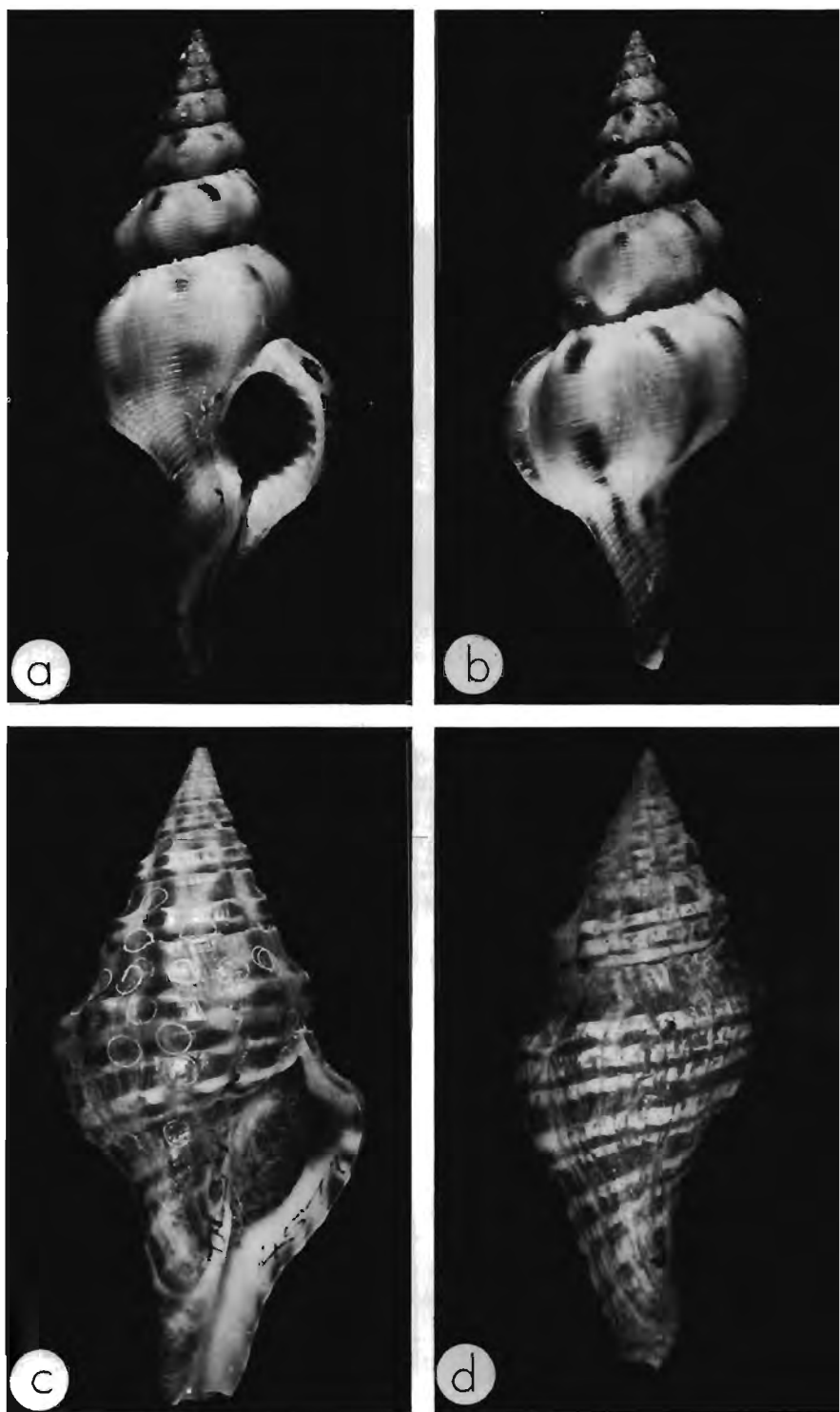


Fig. 11. a, b, *Latirus elisiae* sp. nov. Holotype, $51,4 \times 19,8$ mm. c, *Latirus tigroides* sp. nov. Holotype, $39,3 \times 18,9$ mm. d, *L. tigroides*. Paratype, $71,1 \times 29,7$ mm. Pale rings on holotype are bases of *Nerita* egg capsules.

Type material: Holotype N.M. G2170/T1838, don. Mr & Mrs B. Lafferty.

Remarks: *Latirus elsiae* is closely allied to *L. formosior* Melvill, 1891, but differs in coloration, in its weaker sculpture, larger size and more adnate columella callus. *L. pagodaeformis* Melvill, 1899, from the Gulf of Oman, is also somewhat similar, but is smaller, with much stronger spiral lirae and more numerous axial ribs. There also appears to be some resemblance to *L. fastigium* (Reeve, 1847) from Sri Lanka and the Andamans, and *L. constrictus* (Philippi, 1847) (syn. *Turbinella lyrata* Reeve, 1847) from the Philippines; both of these, however, are reddish-brown in colour, with stronger spiral threads, and different proportions to *elsiae*.

This species is named in honour of Mrs Elsie Lafferty.

Latirus formosior Melvill, 1891 (Fig. 12a, b)

Latirus formosior Melvill, 1891: 394, pl. 2, fig. 16.

The original habitat of this species was unknown, but N.M. specimens from Nacala (Moçambique), Shimoni (Kenya) (don. Mrs H. Jeffreys) and Djibouti (Somalia), appear to be referable. While most are somewhat broader than the type figure and have more convex whorls, one of the Shimoni examples agrees exactly. All specimens are uniform yellow in colour, rather than 'fulvo-ochracea'.

L. formosior is very similar to *L. constrictus* (Philippi), which, however, has a broader, more truncate siphonal rostrum, nine or ten ribs (instead of six or seven) and is reddish-brown in coloration.

Latirus tigroides sp. nov. (Fig. 11c, d)

Latirus polygonus (non Gmelin); Smith, 1903: 369; Barnard, 1959: 83; *idem*, 1969: 622, fig. 12b (radula).

Diagnosis: Fusiform with shouldered whorls and moderately short, narrow siphonal rostrum; later whorls with eight or nine low, rounded shoulder nodules, and barely elevated spiral ridges, spire whorls bicarinate, but not body whorl; ochraceous-brown with more or less interrupted spiral black stripes.

Description: Fusiform, aperture about $1.5 \times$ spire, whorls shouldered, shoulder-slope concave, periphery at or just below mid-whorl; siphonal rostrum subequal in length to rest of aperture, straight, slightly oblique, gently tapering, fasciole strong but rounded, pseudo-umbilicus a narrow slot.

Teleoconch whorls about seven, apex eroded in type material, but 1st whorl with about nine low, wide, suture to suture axial ribs, crossed by fine spiral striae, with a shallow concavity above the middle. On the 2nd whorl this concavity becomes deeper and the ribs become obsolete below the suture; basally the ribs are crossed by two strong cords which increase in strength on subsequent whorls, where they render the periphery biangulate; on the 6th whorl these cords begin to weaken and the basal one has degenerated by the 7th. Axial ribs form gently undulating swellings in apical view, and on the last whorl are reduced to mere shoulder nodules, eight or nine in number. The last whorl shows traces of scarcely elevated spiral cords, becoming somewhat more distinct on the siphonal rostrum. Up to the 6th whorl fine spiral striae are present above the periphery.

Protoconch eroded in types, maximum diameter about 1.2 mm.

Colour ochraceous-buff, rendered darker by the transparent periostracum, and

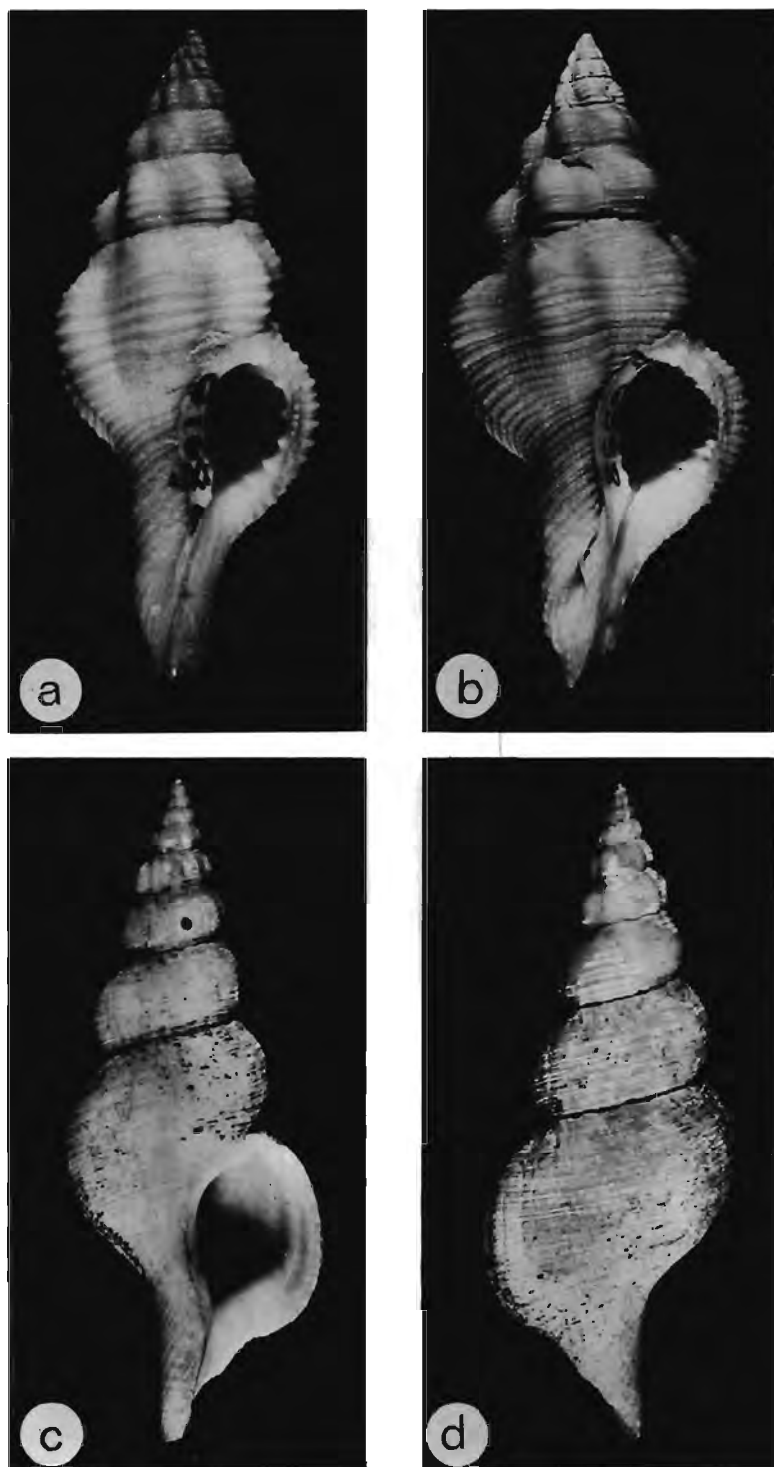


Fig. 12. a, *Latirus formosior* Melvill. Shimoni, Kenya, 28,7 × 11,5 mm. b, *Latirus formosior*. Nacala, Moçambique, 38,3 × 17,4 mm. cd, *Ptychatractus youngi* sp. nov. Holotype, 42,6 × 16,5 mm.

marked by brownish-black spiral stripes and dashes; on the early whorls these markings consist of a series of axial blotches, corresponding to the low axial ribs and interrupted by the twin spiral cords; with growth these blotches intrude on to the rib intervals and tend to merge laterally to form more or less continuous spiral bands and stripes, although irregular blotches still appear on the shoulder slope; aperture white.

Dimensions: 71,1 × 29,7 mm (lip broken); 42,4 × 20,2 mm; 39,3 × 18,9 mm (holotype).

Radula: Cf. Barnard 1969 (loc. cit.).

Distribution: Durban (type locality) to Mzamba (E.L. Mus.) and Umzikaba (S.A.M., rec. Barnard 1969), Pondoland.

Type material: Holotype N.M. 4574/T1835, Durban, leg. P. Elston. Paratypes N.M. 4575/T1837, two, same data, and N.M. 8316/T1836, off Durban, one, don. F. Quekett.

The Quekett specimen is probably that recorded by Smith (1903). It is by far the largest specimen seen, but unfortunately has a filed lip.

Remarks: *Latirus tigroides* has previously been confused with *L. polygonus* (Gmelin 1791), a variable Indo-West Pacific species (with forms *barclayi* Reeve, 1847, *tessellata* Kobelt, 1874 (*non* Recluz 1844) and *belcheri* Reeve, 1847). It differs from *polygonus* in its non-biangular body whorl, practically obsolete sculpture and almost continuous black spiral bands. Sculpture and colour pattern resemble that of *L. amplustre* (Dillwyn, 1817), but shape is much more fusiform. *L. amaliae* (Kobelt, 1874) has decidedly stronger sculpture, a longer siphonal canal and a yellowish-brown aperture.

L. tigroides appears to be endemic to Natal and Pondoland, being replaced in Moçambique by *polygonus*. The latter has not been seen from south of Baía dos Cocos, Jangamo area (N.M.: A. Jenner); material is also available from Bazaruto and Benguera Islands (N.M.). No evidence for intergrading as yet exists, but there is a possibility that the relationship between *polygonus* and *tigroides* may prove to be a subspecific one. Unfortunately information as to the radula structure of the former species is at present not available.

Family Turbinellidae

Ptychatractus youngi sp. nov. (Fig. 12c, d)

Diagnosis: Fusiform, with convex whorls, very narrowly canaliculate sutures, and flaring lip; early whorls with strong axial ribs, later obsolete; fine, rugose spiral lirae are present throughout; columella with two vestigial basal pleats; dull white.

Description: Fusiform, spire somewhat longer than aperture, siphonal rostrum slightly oblique, shorter than rest of aperture; spire whorls convex, periphery median, sutures very narrowly canaliculate. Labrum flaring, strongly arched, its very edge crenulate, interior smooth; body whorl with a low varicoid thickening a short distance behind lip; labium strongly concave, with a thin, adnate callus forming a low, blunt parietal nodule in the posterior aperture angle, and two very oblique and vestigial pleats on the columella base.

Early whorls with strong, almost straight axial ribs, extending from suture to suture, subequal to their intervals and numbering nine on the 1st whorl, increasing to ten on the 4th, becoming weak on the 5th, and obsolete on the 6th whorl. Spiral

lirae distinct throughout, rendered finely and rather obscurely granular by growth lines which are somewhat pliculate in the intervals; spiral lirae number three on the 1st whorl, increasing through the development and strengthening of intermediaries to about twelve on the 4th whorl and twenty-one on the end of the penultimate whorl, where they are alternately weaker and stronger; base and rostrum with about forty-five additional lirae. Colour dull white.

Protoconch smooth, vitreous, about $1\frac{1}{2}$ whorls, of which the initial half whorl is tilted, immersing the nucleus; maximum diameter 1,1 mm.

Dimensions: $42,6 \times 16,5$ mm.

Distribution: Known only from the type locality, off Durban at a depth of 150 fathoms or more.

Type material: Holotype N.M. G1573/T1854, don. B. J. Young.

Discussion: The generic location of the present species will, in the absence of knowledge of the radula, remain debatable. General form is suggestive of several families, but the presence of vestigial columella pleats indicates the Fasciariidae or Turbinellidae. The general facies of *youngi* is closest to certain members of the latter family, namely the genera *Ptychatractus* Stimpson, 1865, and *Metzgeria* Norman, 1879. Unfortunately these two genera seem to be separable solely on dentition; although Cernohorsky (1973) characterizes *Ptychatractus* by the absence of axial ribs, these are actually present in *P. californicus* Dall (1908). The uniformly poor figures available of members of the two taxa seem to indicate that the columella pleats are possibly more basal in *Ptychatractus* than in *Metzgeria*. On the basis of this dubious character *youngi* is tentatively referred to the former genus.

P. youngi differs from all of the recognized North Atlantic and North Pacific species of *Ptychatractus* and *Metzgeria* in the presence of axial ribs on the earlier whorls only. Of South African species, '*Fasciolaria*' *holcophorus* Barnard (1959) is, judging by its similarity to the North Atlantic *Metzgeria decorata* (Locard, 1897), referable to the genus *Metzgeria*, and is hence comparable with *P. youngi*. However shape and sculpture differ very widely between the two.

Fusinus chrysodomoides (Schepman, 1911) from Indonesia shows a close but superficial resemblance to *Ptychatractus youngi*, but differs from the latter in its non-flaring labrum, longer siphonal canal, larger size and absence of columella pleats.

Family Turridae

Gemmula congener (E. A. Smith, 1894) subsp. **webberae** nov. (Fig. 14)

Diagnosis: A subspecies of *G. congener* (E. A. Smith) with a strong but not massive subsutural cord, moderately narrow subsutural groove and relatively high spire; all lirae granulose to gemmulate, gemmules white with brown intervals, main lirae on body whorl becoming progressively weaker basally.

Description: Spire high, about $1,3-1,5 \times$ aperture, orthoconic; siphonal rostrum narrow, canal $0,5-1 \times$ total length of aperture; columella with a weak median swelling internally; anal sinus deep, labrum internally lirate. Subsutural cord strong but not massive, consisting of two or three angular main lirae, of which the median or lower one is the strongest; these lirae bear a series of distinct but irregular granules. Subsutural groove usually narrow, and so restricted as to resemble a second suture, with

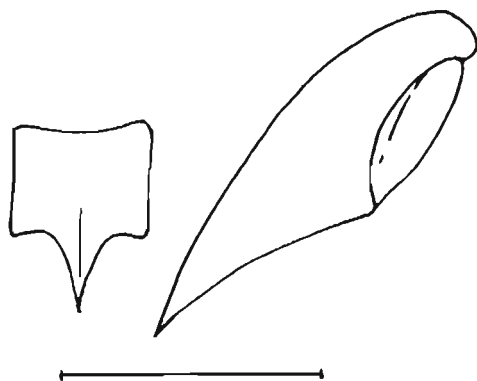


Fig. 13. Radula of *Gemmula congener webberae* subsp. nov. Paratype 1. Line = 0,1 mm.



Fig. 14. *Gemmula congener webberae* subsp. nov. Holotype, 52,1 × 16,3 mm.

two fine threads above, and two strong and decidedly crenulate lirae on the relatively wide and sloping lower border. Shoulder keel not much stronger than subsutural one, rather flat-topped, bearing a series of transversely dumbbell-shaped, orthocline gemmae, 30–38 in number on the last whorl, but degenerating into groups of coarse growth plicules just behind the lip; the crest of the keel, between each pair of gemmae, bears a shallow spiral groove; two gemmulate lirae (one on early whorls) lie between the shoulder keel and the lower suture, and the base of the body whorl bears 8–10 additional main lirae, becoming progressively weaker basally, plus a series of fine, close lirae on the fasciole; the interval between each pair of main lirae bears 1–4 fine intermediaries, and similar fine ridges may run along the crests of the main lirae and those of the subsutural cords. Fine growth plicules are present throughout, being most conspicuous in the intervals. Ground colour off-white, subsutural cord (and in some the base of the body whorl) suffused with red-brown; gemmules, including those of the subsutural cord, and gemmae are white with dark red-brown intervals, giving the main spiral cords an articulated appearance.

Teloconch whorls ten; protoconch conical, multispiral, of approximately three whorls (the very tip is missing), initially smooth, but greater part of last whorl with a series of fine, arcuate, suture to suture ribs.

Dimensions: 52,1 × 16,3 mm (holotype), 61,5 × 20,1 mm (paratype, apex and lip broken); 55 × 18,1 mm, 56,1 × 18,1 mm (paratypes).

Operculum leaf-shaped, acute basally, growth lines strong.

Radula as in *Gemmula congener diomedea* (Powell, 1964) (cf. Powell, 1966: text-fig. C51), but with a well-developed unicuspidate rachidian plate.

Distribution: Durban to off Limpopo River mouth in about 150 fathoms.

Type material: Holotype N.M. A1249/T1842, trawled off Durban in about 150 fathoms, don. Mrs G. Webber. Paratype 1, N.M. G2706/T1844, slide M125, trawled off Limpopo River mouth in about 150 fathoms, don. C. P. Fernandes; paratypes 2, 3, N.M. G2707/T1845, same data. Paratypes 4, 5, N.M. A1252/R1843, topotypes, broken, locality unknown, don. R. Cruickshank.

Remarks: This striking new turrid agrees in most respects with the original description and figures of *Pleurotoma congener* E. A. Smith (1894: 160, pl. 3, figs 4, 5) from the Bay of Bengal, but differs in its higher spire and strongly gemmulate, spotted basal lirae. Powell (1964: 251) has treated *Gemmula congener* as the nominate subspecies of a complex whose composite range extends from the north-western Indian Ocean to Japan and Hawaii. Oyama (1966) has restored these taxa to full species status, and certainly the vestigial rachidian radula plate of *diomedea* and the well-developed unicuspidate plate of *webberae* show that these two at least are not conspecific. Unfortunately the dentition of *G. congener* s.s. is unknown, so that a final decision as to the true status of *webberae* is at present impossible. The position is further complicated by the fact that Powell's interpretation of *Gemmula congener congener* conflicts in several respects with the original description and figures, notably in the massive subsutural cord and unspotted shoulder keel. Whether the two merely represent the extreme ends of an infraspecific variation spectrum remains to be proven. Powell also recorded spotted, high-spired individuals from off Somalia which could well be compared with *webberae*.

Of the three Pacific subspecies recognized by Powell, *webberae* is closest to *unilineata*

Powell, 1967, from Hawaii; that subspecies has a lower spire, a wider subsutural groove, and basal cords which are unspotted and only partially gemmulate.

Named in honour of Mrs G. Webber of Pietermaritzburg, who first made material of this subspecies available.

***Turris tanyspira* sp. nov. (Fig. 15)**

Diagnosis: Spire very high and acute, siphonal rostrum short, narrow and oblique, body whorl very convex; later whorls with four subequal, smooth spiral lirae. Coloration yellowish, streaked with dark brown, shoulder cord almost immaculate.



Fig. 15. *Turris tanyspira* sp. nov. Holotype, 49 × 15,6 mm.

Description: Spire high, about $1,5 \times$ aperture in length, apex acute, sutures narrowly channelled, whorls moderately convex, body whorl strongly so. Anal sinus deep and narrow, its apex aligned with the shoulder cord, but its posterior limb unfortunately mutilated in the holotype; siphonal rostrum narrow, tapering, oblique and short (about half the length of rest of aperture).

Protoconch missing, thirteen whorls remaining. First teleoconch whorl damaged, subsequent whorls with three subequal cords, initially feebly granular, plus a weak fourth lira just above the suture; this fourth lira becomes progressively stronger, and by the penultimate whorl is almost as strong as the others; on later whorls the second (shoulder) cord is dominant. From about the 6th whorl the crests of the three main cords bear a shallow median furrow, and their sides become progressively more sloping, with fine intermediate lateral threads, one on each side of the subsutural cord, and one in each other interval; subsutural cord separated from shoulder cord by a deep but very narrow sulcus. Base and rostrum with about 28 lirae, alternately somewhat weaker and stronger, those on the rostrum being weakly nodulose.

Colour pale yellowish with conspicuous axial streaks and blotches of dark brown; the shoulder cord is rendered conspicuous by the presence of only a series of small spots of this colour; rostrum and aperture lilac-tinged.

Dimensions: $49 \times 15,6$ mm (holotype).

Type locality: Trawled north of Beira, Moçambique, in 10–20 fathoms.

Type material: Holotype N.M. G2710/T1855, don. B. Keyter.

Discussion: *Turris tanyspira* is very closely allied to the Japanese *Turris nadaensis* Azuma, 1973, but its spire whorls are rounded, not angulate, the siphonal rostrum is shorter and more oblique, the markings are dark brown, not dark violet, and the spiral lirae seem to be stronger. The only other comparable species is *Turris undosa* (Lamarck, 1816) from the tropical West Pacific, which is narrower, with barely convex body whorl and longer siphonal rostrum.

Although the unique holotype of *T. tanyspira* is in very fresh condition, the extreme posterior end of the labrum has been eroded away by some boring organism; the course of the anal sinus can be traced by reference to earlier growth scars.

Family Architectonicidae

***Heliacus (Mangonuia) rotula* sp. nov. (Fig. 16)**

Diagnosis: Lenticular with square-set, bicarinate periphery, umbilicus wide, walls micro-cancellately sculptured; whorls with curved axial ribs, a weak subsutural cord and a stronger suprasutural one.

Description: Lenticular, spire slightly raised, whorls convexly sloping, not stepped; periphery of body whorl bicarinate and square-set; suture narrowly canaliculate; umbilicus wide.

Teleoconch whorls three, all with retractively curved axial ribs on both upper and lower surfaces, increasing from about 40 on the 1st whorl to about 70 on the last; they are rather irregular in strength throughout, with frequent weaker intermediaries. First whorl with a suprasutural cord demarcated by a fairly deep groove, and in some cases a much weaker subsutural lira, demarcated by a proportionally shallower and finer groove; development of this subsutural lira may be delayed until the 2nd whorl or suppressed completely, and on the later whorls it is always feebly developed, the limiting subsutural groove barely incising the axials. On later whorls the subsutural cord is very conspicuous, and is rendered gemmulate where crossed by the axial ribs; on the last whorl this cord, together with a slightly weaker inferior one, produces a bicarinate profile, the two being separated by a wide, tabulate groove, bearing a single



Fig. 16. *Heliacus (Mangonuia) rotula* sp. nov. Holotype, 3×5 mm.

fine lira. Outer side of base with two or three low lirae, and there is a well-developed circum-umbilical cord, bearing 18–20 strong crenules. Umbilical walls cancellated by fine axial and spiral striae. Very pale biscuit colour, but types evidently bleached.

Protoconch of about three smooth whorls, initially orange; maximum diameter 0,75 mm; limits marked by a distinct varix.

Dimensions: $2,3 \times 4,4$ mm, maximum umbilical diameter 1,3 mm; 3×5 mm, umbilicus 1,3 mm (holotype); $2,7 \times 5,3$ mm, umbilicus 1,6 mm.

Distribution: Known only from the type locality, Durban Bay, in shallow dredgings.

Type material: Holotype N.M. A1570/T1851 (leg. B. J. Young) paratypes 1, 2; N.M. A1569/T1850, same collector; paratype 3, in coll. B. J. Young.

Remarks: *Heliacus (Mangonuia) rotula* is closely allied to *H. (M.) costatus* (Schepman, 1909) from Indonesia, but differs in its more narrowly channelled suture, in the absence of either a distinct subsutural row of tubercles or interstitial spiral striae between the ribs, and in the possession of fewer spiral cords on the base. *H. (M.) caelatus* (Hinds, 1844) from the Straits of Macassar also appears to be somewhat similar, but has a row of well-developed subsutural nodules and a single, distinct spiral lira within the umbilicus, absent in *rotula*. It should be noted that Sowerby's record (1900: 5) of *caelatus* from Pondoland was based on specimens of *H. (M.) dorsuosus* (Hinds, 1844) which are still preserved in the Hermann Becker collection in the Transvaal Museum. *H. dorsuosus* differs from *rotula* in its axial ribs being cut

by spiral grooves into little beads, in the presence of a single lira on the walls of the umbilicus, and in several other major characters.

Family Epitoniidae

***Opalia (Claviscala) terebralioides* sp. nov. (Fig. 17)**

Diagnosis: Large (7 cm), acuminate, whorls gently convex, with strong, rounded axial ribs, eighteen on body whorl, which shows a strong basal cord, visibly above suture on spire whorls; whole surface, except for basal disc, covered by micro-cancellate striae; uniform buff.

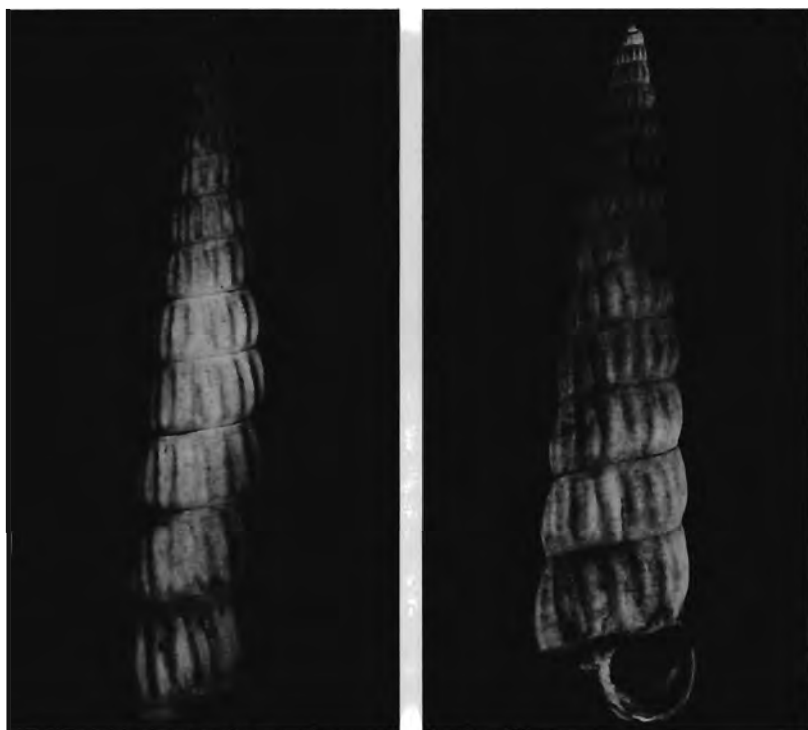


Fig. 17. *Opalia (Claviscala) terebralioides* sp. nov. Holotype, 71 × 16,8 mm.

Description: Relatively large, acuminate, at least fourteen teleoconch whorls, apical ones missing, whorls gently convex, sutures relatively shallow; base a little concave, basal periphery with a strong, rounded spiral cord, showing above suture on spire whorls; aperture ovate, columella gently curved, paries with an inconspicuous callus, labrum thin. Sculptured by gently rounded, moderately arcuate, slightly oblique axial ribs, increasing from fifteen on the 1st whorl to eighteen on the body whorl, each rib being subequal to or slightly narrower than the intervals; entire surface, save for the basal disc, covered by a micro-cancellate sculpture of spiral and axial striae. Colour uniform pale buff, dull.

Dimensions: $71 \times 16,8$ mm (holotype).

Distribution: Trawled in about 150 fathoms on a mud bottom in southern Moçambique, between Inhaca Island and the Limpopo River mouth.

Type material: Holotype (N.M. G2568/T1840), a dead shell, don. B. Lafferty.

Remarks: *Opalia terebralioides* differs from *O. richardi* (Dautzenberg & De Boury, 1897) from the Azores, type-species of *Claviscala* de Boury, 1909, in its larger size, fewer ribs, flatter whorls and more angular base. It approaches *O. midwayensis* (Habe & Kosuge, 1970) from Midway Island, Central Pacific, in size and colour, but that species is narrower, with very convex whorls, and fewer, stronger axial ribs. The only other Recent *Claviscala* appears to be the Japanese *O. kuroharai* (Kuroda) (figured by Habe, 1964: pl. 14, fig. 29), which resembles *O. terebralioides* in sculpture and whorl profile, but it is narrower and smaller, and is coloured purple-brown, with yellowish ridges and ribs.

***Alora rapunculus* sp. nov. (Fig. 18a, b)**

Diagnosis: Ovate-trochiform, solid, narrowly umbilicate, whorls globular, aperture with a very shallow pseudo-siphonal notch; sculpture cancellate on early whorls, predominately spiral with interstitial axial plicules on later whorls; off-white, mottled with lilac.

Description: Ovate-trochiform, spire more or less cyrtconic, subequal to aperture or slightly longer; whorls strongly convex, periphery median or situated towards base, sutures deeply impressed, almost channelled; aperture ovate, outer lip evenly arched, paries more or less straight, columella strongly curved, base with a shallow pseudo-siphonal notch, umbilicus narrow, partly covered by the slightly reflected edge of the columella callus.

Protoconch broken, apparently smooth and stiliform, teleoconch whorls about six. First whorl with nine or ten fine, close spiral lirae; these do not increase in number but become progressively more widely spaced; on the 2nd to 4th whorls lirae are subequal to their intervals, and are rendered cancellate by oblique, subequal axial ribs; the interstices bear microstriae. From 4th whorl spiral sculpture is dominant, the axial element being reduced to interstitial plicules by the penultimate whorl; an occasional fine spiral intermediary is also present. On the base the main spiral lirae are rather coarse, becoming progressively weaker around the umbilicus.

Colour white, tinged or blotched with lilac or biscuit-colour. Periostracum not present in cleaned type material.

Operculum ovate, paucispiral, thin, orange-brown with strong growth lines.

Dimensions: $21,3 \times 15,8$ mm; $20,9 \times 15,4$ mm; $17,7 \times 12,7$ mm (holotype); $14,7 \times 12,2$ mm.

Distribution: Trawled off Moçambique, exact habitat and depth unknown.

Type material: Holotype N.M. G2187/T1839, don. Mrs H. Boswell; paratype 1, N.M. G2183/T1838, don. A. Visage; paratypes 2 and 3 in coll. Mrs H. Boswell.

Remarks: I can find no grounds by which to separate the Japanese *Akibumia* Kuroda & Habe, 1859, from the Panamic *Alora* H. Adams, 1861, save for the presence of a very weak pseudo-siphonal canal in the latter. Both taxa are known from shell data alone, but Keen (1969: 439) was probably correct in transferring *Alora* from the Trichotropidae to the Epitoniidae. Certainly the operculum of *Alora rapunculus*

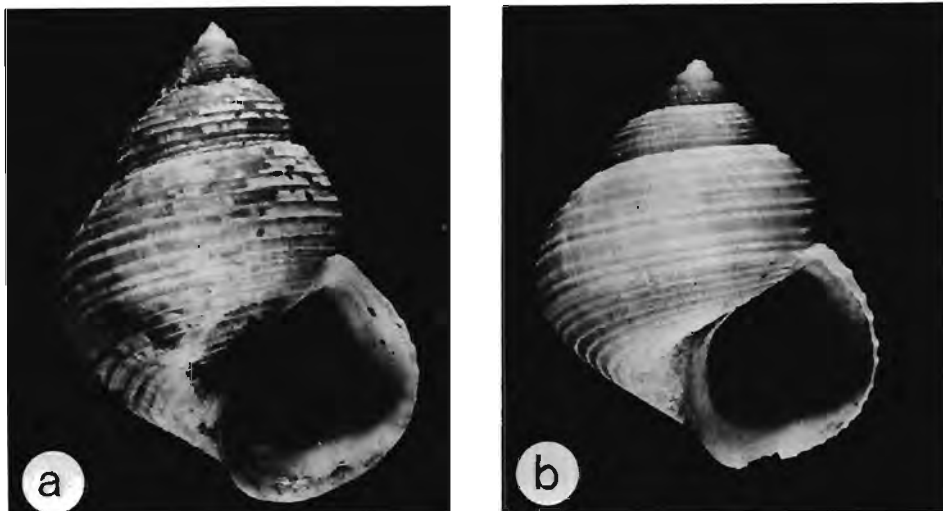


Fig. 18. a, *Alora rapunculus* sp. nov. Holotype, 17,7 × 12,7 mm. b, *A. rapunculus*. Paratype, 14,7 × 12,2 mm.

resembles that of an *Epitonium* rather than a *Trichotropis* (cf. Fischer, 1887: fig. 458). However the reported presence of a periostracal layer is an atypical character in the Epitoniidae.

Alora rapunculus differs from the tropical West American *gouldii* (A. Adams, 1857) in its much weaker axial sculpture, more globular form and shorter aperture. It differs from the two described Japanese *Akibumia* spp. in its solid, opaque shell and distinct, pseudo-siphonal canal; *Akibumia flexabilis* (Kuroda & Habe, 1958) further differs in its flattened periphery, while *A. reticulata* (Habe, 1962), apparently based on a juvenile, is narrower with a conspicuously flat-sided spire and cancellate sculpture.

BIVALVIA

Family Glycymeridae

Glycymeris (*Tucetona*) *maskatensis* (Melvill, 1897) (Fig. 19)

Pectunculus maskatensis Melvill, 1897: 24, pl. 7, fig. 32, 32a; Thiele & Jaeckel, 1931: 35.

Glycymeria maskatensis; Melvill, 1928: 113; Prashad, 1932: 66, pl. 2, figs 19, 20.

Glycymeris amboinensis (non Gmelin, 1791); Spry, 1964: 7, pl. 1, no. 3.

Glycymeris cf. *pectiniformis* (non Lamarck, 1819); Barnard, 1964: 381.

?*Pectunculus pectiniformis* Lamarck; Von Martens, 1879: 741.

Pectunculus maskatensis was based on an immature specimen (22 × 25 mm) from the Gulf of Oman, characterized by its shallowly bifid radial ribs. The adult state has been figured but not described.

G. maskatensis closely allied to *G. pectunculus* (Linn., 1758) and *G. amboinensis* (Gmelin, 1791) from the Western Pacific, and is probably the basis for western Indian Ocean records of these species. It differs in its deeper valves, with narrower and more elevated radial ribs which are shallowly bifid in juveniles, flat-topped (at least anteriorly) in adults. It is not uncommon in Mozambique and the badly eroded valves recorded by Barnard as cf. *pectiniformis* [= *pectunculus* Linn., 1758] extend the known range south into Natal.

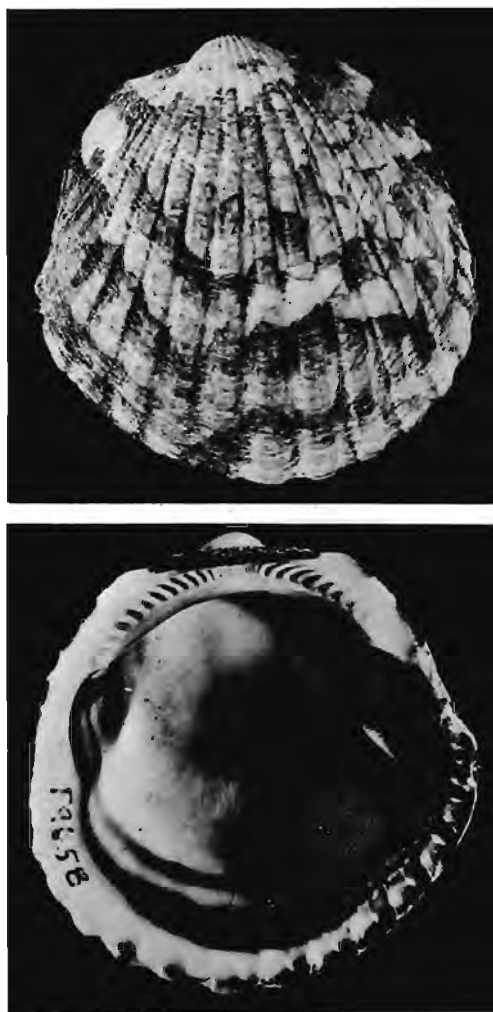


Fig. 19. *Glycymeris maskatensis* (Melvill), right valve. Santa Carolina I., Moçambique, 38,5 × 39,6 mm.

Locality records: Gulf of Oman: Muscat (type locality); Persian Gulf (Prashad). Red Sea: Dahlak Island (N.M.). Kenya: Zanzibar Channel (Thiele & Jaeckel, 1931). Tanzania: Dar es Salaam (Spry). Moçambique: Quirimba Island (Von Martens); Moçambique Island (N.M.: A. Enes); Bazaruto and Santa Carolina islands (N.M.: Mrs E. Roscoe); Inhambane (N.M.: R. Cruickshank); Zululand: off Neill Peak, 90 fathoms (Barnard); Natal: off Umhloti River, 40 fathoms, off Durban, 54 fathoms, and off Illovo River, 27–30 fathoms (Barnard).

Description: Orbicular, umbo more or less median, anterior margin evenly curved, posterior one usually slightly biangulate. Radial ribs 22–25, strongest medially, becoming weak anteriorly and posteriorly; in juveniles these ribs are very shallowly, bifid, but with age the median groove becomes obsolete; ribs remain more or less flat-topped (except posterior to the middle where they are usually a little rounded)

and the sides steep; tops of ribs frequently bear traces of low, transverse ridges, and the intervals between the ribs, which are about two-thirds of the width of the latter, bear pliculate growth lines. Interior of valves radiately striate, ventral margin with about 34 paired plicae, corresponding to the external interradiar spaces, and in young examples the postero- and antero-dorsal margins bear a series of fine granules, parallel to the hinge teeth. Adductor muscle scars are subequal. Hinge plate evenly curved, teeth very weak medially, 10–13 posteriorly, 12–15 anteriorly. Ligament amphidetic to largely prosodetic.

Colour cream with irregular brown blotches and an open pattern of fine reticulated lines of red-brown; interior dark brown, paler anteriorly.

Dimensions: $52,8 \times 49,7 \times 34,6$ mm; $46,7 \times 46,6 \times 30,3$ mm; $38,3 \times 39,4 \times 24,4$ mm.

Family Pteriidae

Kilburn (1973: 700) briefly summarized the genus *Pinctada* as represented in South African waters. The other members of the Pteriidae known to occur in South Africa and Moçambique are here discussed. No doubt further species await discovery in Moçambique. A single worn valve from Santa Carolina Island, for example, may represent *Pinctada maculata* (Gould, 1850), erroneously recorded from 'South Africa' by Jameson (1901: 391) as *Margaritifera panasesae* Jameson. *Avicula* (*Meleagrina*) *petersi* Dunker (1852: 77) from Quirimba Island is unrecognizable from the brief description, and was overlooked by Dunker (1872, 1879–1880), by Jameson (1901) and by Ranson (1961). It was probably based on one of the numerous morphs of *Pinctada nigra* (Gould, 1850) or *P. radiata* (Leach, 1814).

Pinctada margaritifera (Linn., 1758)

Pinctada margaritifera; Ranson, 1961: 52 (references and synonymy), pls 29–37, text-figs 15–18.

Margaritifera margaritifera var. *zanzibarensis* Jameson, 1901: 375.

Avicula (*Meleagrina*) *margaritifera*; Von Martens, 1879: 740.

Moçambique records: Bay of Moçambique (N.M.: K. Grosch) and Moçambique Island (Von Martens 1879); Bazaruto Island (Jameson 1901); Benguera Island (N.M.: Mrs E. Roscoe); Inhambane (N.M.: R. Cruickshank). The Delagoa Bay shell identified by Braga (1952: 99, pl. 8, fig. 1) as *P. margaritifera* is apparently referable to *P. capensis*.

Pinctada margaritifera normally differs from *P. capensis* (Sowerby 1889) in the presence of rays of more or less conspicuous white growth processes, visible around the margins even in gerontic and overgrown examples. The markedly shallower byssal sinus of the right valve and the black zone which borders the nacre in *P. margaritifera* also aid in separating them.

Available material is insufficient for me to decide whether *zanzibarensis* or any of the other geographic variations distinguished by Jameson might be valid subspecies.

Electroma physoides (Lamarck, 1819)

Avicula physoides Lamarck, 1819: 149; Lamy, 1935: 132.

Avicula zebra Reeve, 1857: pl. 11, fig. 36; Sowerby, 1897: 27.

Pteria zebra; Barnard, 1964: 411.

Avicula vexillum Reeve, 1858: pl. 17, fig. 70 **syn. nov.**

Pteria vexillum; Barnard, 1964: 412, fig. 12a.

Pteria tomlini Prashad, 1932: 94, pl. 3, figs 3, 4.

Without exception authors have overlooked Lamy's notes on the identity of the type material of *Avicula physoides*, and have utilized the later name *zebra* Reeve. Over and above this, the N.M. series shows that the range of colour variation in the species has been greatly underestimated. Apart from individual variation, patterns may alter with growth, and may even differ on opposite valves of the same specimen. Normally the shell is translucent off-white, with blackish- or reddish-brown lines which are separated into a dorsal and a ventral series by a median dark line. Typically the dorsal series diverges from the median, while the ventral series is subparallel to the latter, but sometimes both series may diverge to form a 'herring-bone' pattern (*vexillum*) or they may both run parallel to the median. In others (*tomlini* and the type figure of *vexillum*) the median line is absent. Most interesting of all is a specimen from Santa Carolina Island (collected together with a typical *E. physoides*) which is uniform dark yellowish-brown, without any sign of markings. A perfect connecting link is provided by a Zululand shell which is normal save that the median line is replaced by a broad ray of yellowish-brown.

Locality records: Moçambique: Santa Carolina Island (N.M.: Mrs E. Roscoe); between Santa Carolina Island and mainland, 10–40 ft (N.M.: R. Cruickshank); between Benguera and Bazaruto Islands, 10–40 ft (N.M.: R. K., P. & E. Roscoe); Delagoa Bay and Inhambane (Barnard). Zululand: St Lucia beach (N.M.: H. Bell-Marley). Natal: Tongaat (N.M.: H. Burnup); Durban (Barnard); Umkomaas (N.M.: Burnup). Cape: Port Elizabeth (Sowerby); St Sebastian Bay in 75 m, and False Bay (Barnard). Elsewhere widely distributed through the Indo-West Pacific.

Pteria tortirostris (Dunker, 1848) (Fig. 20)

Avicula tortirostris Dunker, 1848: 179; *idem*, 1872: 37, pl. 11, fig. 6.

Pteria chinensis (non Leach); Tomlin, 1931: 446; Barnard, 1964: 411, fig. 12d.

This very variable species has previously been recorded from the southern African region as *Pteria chinensis* (Leach, 1814) [= *P. avicular* (Holten, 1802)]. That species is discussed below.

Pteria tortirostris is characterized by its right valve being conspicuously smaller than the left, by the more or less strongly twisted anterior ala, which is well-differentiated even in the left valve, and by the more or less greatly produced posterior ala, which is smooth save sometimes for fine radial striae and a feeble bordering angle; coloration is variable, ranging from almost blackish-brown to purplish-brown, sometimes with pale radial lines, but usually only with undulating concentric stripes; the periostracum is very fine and close with short processes.

P. tortirostris was originally described from Java. *Avicula marmorata* Reeve, 1857 (non Philippi, 1848) may be based on a short-winged example. *A. brevialata* Dunker, 1872, from the tropical West Pacific may be conspecific, but appears to be less inequivalve, with a somewhat less twisted anterior ala and deep chestnut coloration; the value of these characters is doubtful. The present material shows much variation in shape. Even the characteristic prominent and strongly twisted anterior ala may in extreme examples be short, straight and beak-like.

Locality records: Moçambique: Santa Carolina Island, juveniles on soft coral (N.M.: Mrs E. Roscoe); Lourenço Marques and Ponta Maona, Delagoa Bay (N.M.). Natal: Umhlali (N.M.: H. Burnup, specimen recorded by Tomlin, 1931); Isipingo, a juvenile

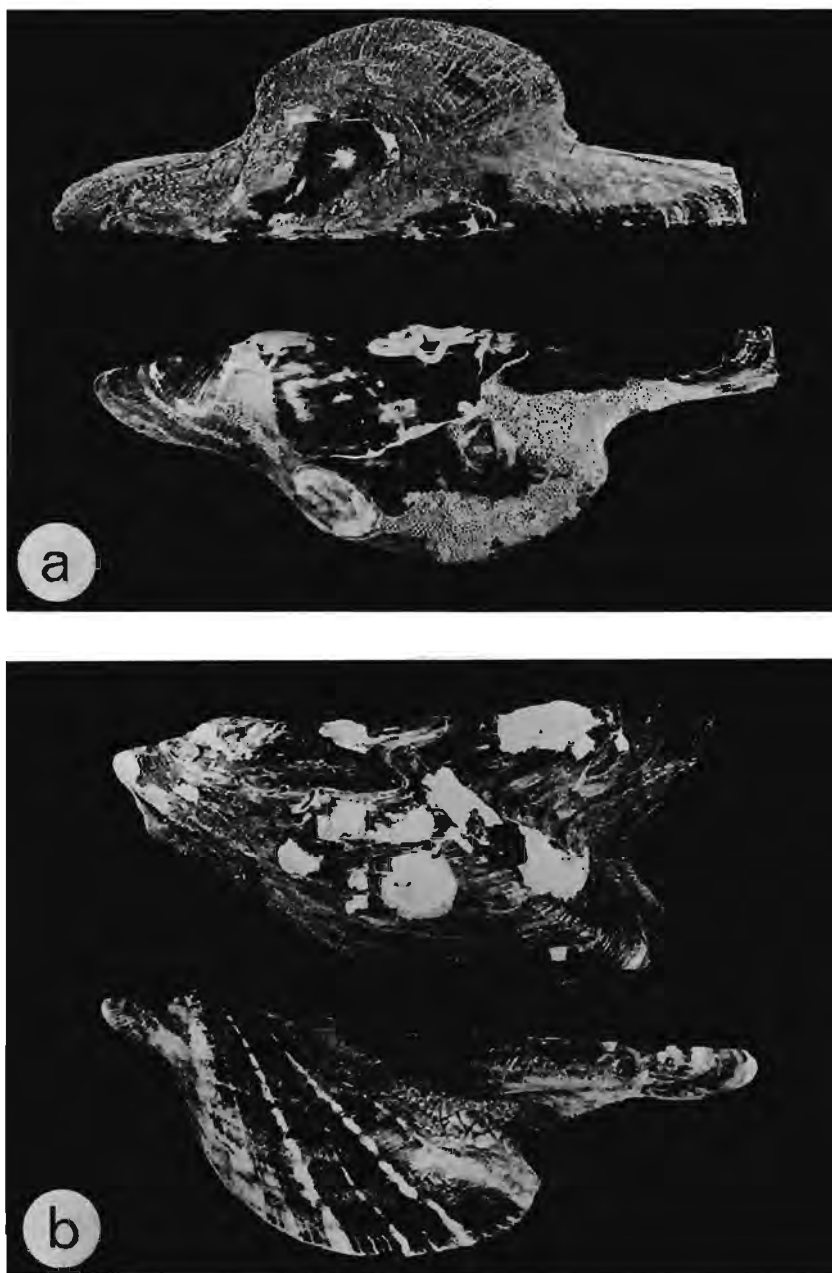


Fig. 20. a, *Pteria tortirostris* (Dunker). Lourenço Marques, $60 \times 18,7$ mm. b, *P. tortirostris*, left valves of extreme variants. Upper shell is a short-winged example; although the edge is damaged, the course of the growth lines is clear; Nthlonyane, Transkei, $52,7 \times 25,2$ mm. Lower shell shows a degenerate anterior ala and radial colour pattern: Ponta Maona, Delegoa Bay, $56,3 \times 19,8$ mm.

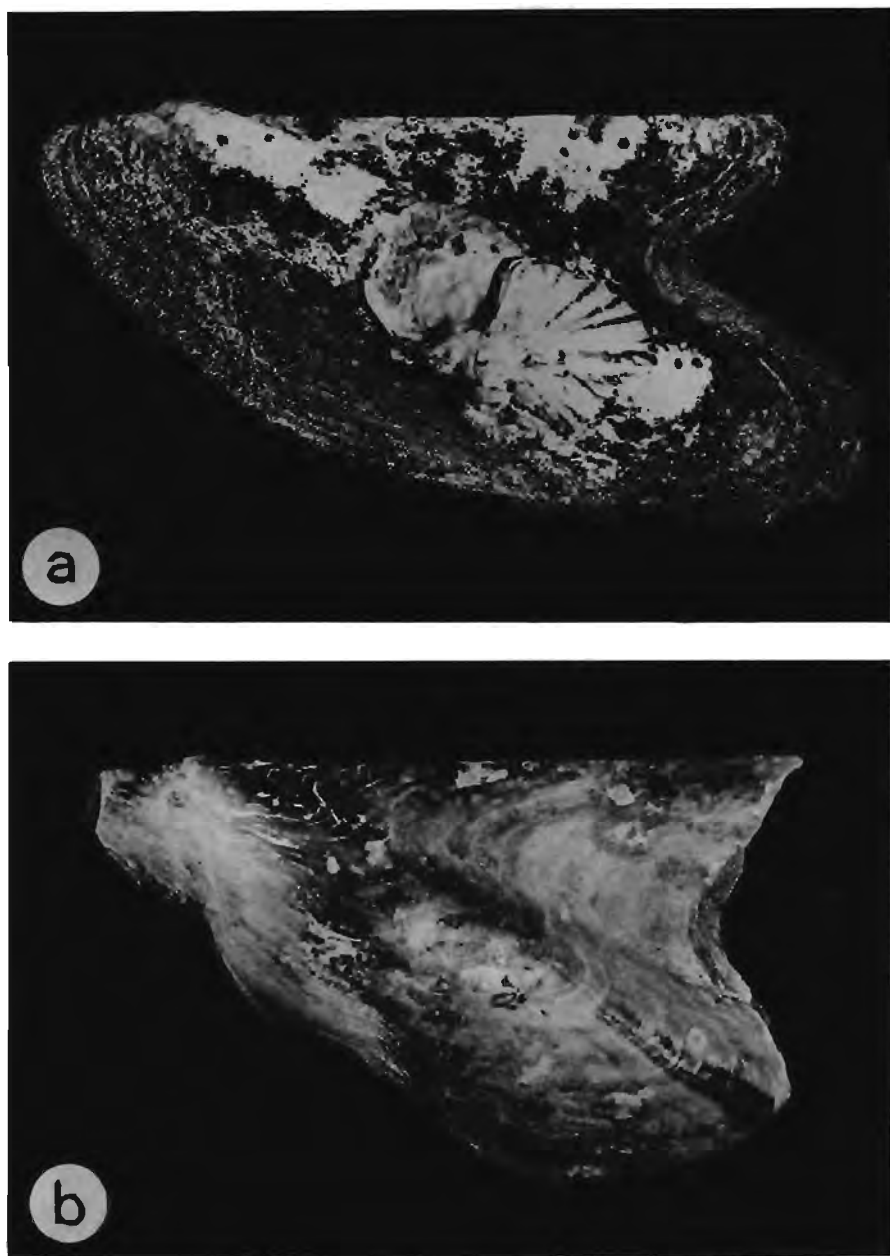


Fig. 21. a, *Pteria savignyi* (Deshayes), left valve, Santa Carolina I., Moçambique, 105.2 \times 50 mm.
b, *Pteria avicular* (Holted), left valve, Nacala, Moçambique, 46 \times 28 mm.

(N.M.: W. Falcon); Park Rynie, single valve (N.M.: R.K.). Transkei: Umtata River mouth, living offshore on a red gorgonian (N.M.: Mrs R. Trow); Nthlonyane (N.M.: R.K.).

Pteria savignyi (Deshayes, 1830) (Fig. 21a)

Avicula savignyi Deshayes, 1830: 100; *idem*, 1836: 102.

Avicula aegyptiaca 'Chemnitz' Pallary, 1926: 116, pl. 11, fig. 6.

Pteria aegyptiaca; Lamy, 1929: 111; *idem*, 1935: 128.

Pteria chinensis (non Leach); Boshoff, 1965: 121, pl. 1, fig. 3.

Non Avicula savignyi; Reeve, 1857: pl. 18, fig. 71 [= *Avicula morio* Leach, 1914].

This poorly known species differs from *P. tortirostris* in its larger adult size (105 as opposed to 60 mm), and very poorly differentiated left anterior ala, the byssal sinus being more or less obsolete in this valve; the periostracum is coarsely fimbriated, particularly anteriorly; the posterior ala is short, rarely projecting beyond the postero-ventral margin, and the colour is a more or less uniform dark chestnut to blackish-brown.

Locality records (type locality Red Sea): Moçambique: Santa Carolina and Bazaruto Islands (N.M.: Mrs E. Roscoe); Inhaca Island (Boshoff).

Pteria avicular (Holten, 1802) (Fig. 21b)

Mytilus avicular Holten, 1802: 31 (based on Chemnitz, 1795: 255, pl. 205, figs 2025–2026).

Pteria chinensis Leach, 1814; Prashad, 1932: 92 (references and synonymy).

Pteria avicular (= *Avicula crocea* Lamarck, 1819) has been much misunderstood by authors because of Reeve's misleading figure (1857: pl. 15, fig. 57) which shows a completely distinct species. The true *P. avicular* is a characteristically iridescent gold to brownish-orange, with or without a few dark median rays, and the posterior ala is rather short, in adults at all events; the anterior ala is well-differentiated and not (or barely) twisted; the periostracum is fine, and judging by the limited material available, hardly fimbriated. Length 46 mm.

Locality records: Sri Lanka (type locality), Indonesia, Dar es Salaam. Moçambique: Nacala (N.M.: P. Elston).

Pteria penguin (Röding, 1798)

Pteria penguin (Röding, 1798); Prashad, 1932: 93 (references and synonymy).

This well-known species is recorded from the Philippines to the Malagasy Republic. Also Moçambique: Moçambique Island area (N.M.: K. Grosch).

Family Limidae

Limatula vermicola sp. nov. (Fig. 22)

Diagnosis: Subequilateral, shape oblong-ovate, with evenly curved sides; radial ribs fine, weak on either side, one median rib relatively conspicuous, all ribs crossed by concentric threads, forming low beads; interior with two median ridges, demarcating a shallow groove.

Description: Oblong-ovate, greatest width in middle, sides evenly curved, subequilateral, ventral margin broadly rounded, umbo moderately elevated, ears subequal, obtusely angled, anterior ear bordered by only the slightest suggestion of a byssal

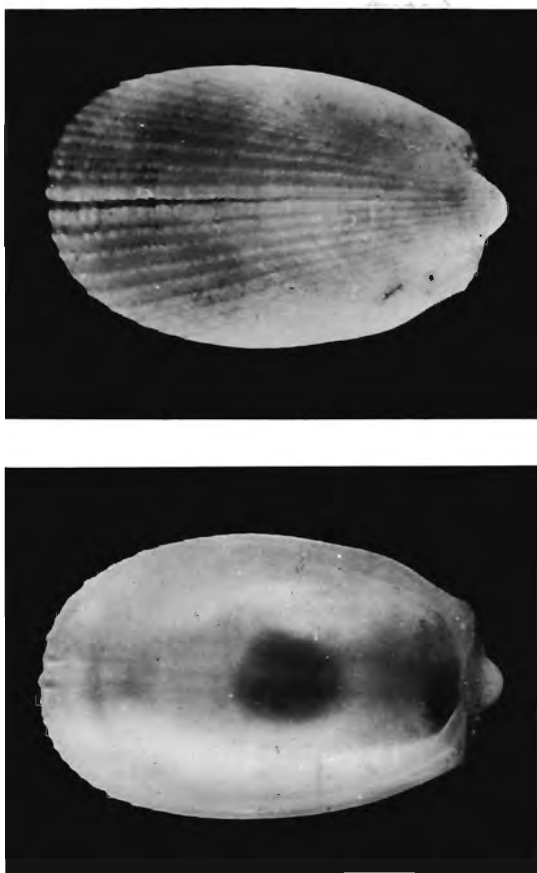


Fig. 22. *Limatula vermicola* sp. nov. Right valve of holotype, $4 \times 6,5$ mm.

sinus. Sculpture of approximately 60 low, thin, radial ribs, half to one-third the width of their intervals; a median rib is slightly stronger than the others, and the interval just anterior to it is significantly deeper; the ribs become progressively weaker towards either side (but do not evanesce) concentric threads are rather well-developed, and form low nodules where they cross the ribs, becoming rather squamulose towards the ventral margin.

Inner margin with feeble, rather widely spaced crenules; middle of interior with a shallow but distinct longitudinal groove (corresponding to the median exterior rib), bordered on each side by a feeble ridge, of which the anterior one is the stronger. Hinge margin on each side of ligament with a series of microscopic crenules; ligament forming an obtuse triangle (apical angle about 70°), occupying slightly more than the median third of the hinge plate, colour pale amber.

Shell uniform white. Mantle colourless, tentacles few but relatively large. Dimensions: $4 \times 6,5$ mm, inflation 3,9 mm (holotype), $4,1 \times 6,2$ mm, inflation 3,9 mm (paratype).

Type material: Holotype N.M. G2713/T1858, from a sandbank between Santa Carolina Island and the mainland. Paratypes, one complete, in alcohol (N.M. G2714/T1859) and one left valve (N.M. G2716/T1862). Paratypes (N.M. G2715/T1860); two right valves, from sandbank south of Santa Carolina Island.

Distribution: Known only from sandbanks around Santa Carolina Island, Moçambique (21°37'S, 35°20'E). It occurs living in colonies of worm-tubes forming consolidated patches in the sand around low spring tide.

Remarks: *Limatula vermicola* is very closely allied to *L. leptocarya* (Melvill, 1898) from the Gulf of Oman and Indonesia, but in that species the median sulcus is 'hardly perceptible', and the ribs not only appear to be smooth, but they are evanescent on the sides. *L. kurodai* Oyama, 1943, from Japan, has its greatest width *above* the middle. *L. pusilla* (H. Adams, 1870) from the Red Sea and Tanzania, is more elongate with stronger ribs and more unequal ears.

Family Tellinidae

Psammotreta (Pseudometis) gubernaculum (Hanley, 1844) **stat. rev.** (Fig. 23)

Tellina gubernaculum Hanley, 1844: 142; *idem*, 1846: 325, pl. 62, fig. 186.

Tellina papyracea Spengler, 1798 (*non* Gmelin, 1791): 98 **syn. nov.**

Tellina (Macoma) papyracea; Lyngé, 1909: 206, pl. 3, figs 50-52 (holotype).

Tellina truncata Jonas in Philippi, 1843 (*non* Linn., 1767): 71, pl. 1, fig. 2; Hanley, 1846: 325, pl. 62, fig. 198 **syn. nov.**

Tellina praerupta Salisbury, 1934: 90. **syn. nov.**



Fig. 23. *Psammotreta gubernaculum* (Hanley), left valve, Tugela Bay, 20 fathoms, 43 × 31,1 mm.

Although Lynge believed *Tellina truncata* [= *T. praerupta*] to be a valid species, the opinions of most other authors and the evidence of the available material indicate it to be merely an extreme form of *papyracea*. As the latter name is preoccupied, recourse must be made to Hanley's *gubernaculum*. Although the latter was originally stated to be West American in origin, Lynge (loc. cit.) and Keen (1971: 900) regarded this locality as undoubtedly erroneous. In all probability *Tellina* (*Macoma*) *arafurensis* E. A. Smith, 1885 [= *Psammotreta* (*Pseudometis*) *papyracea keenae* Habe, 1964] is another synonym.

Natal/Zululand records: Off Tugela River, 20 fathoms (N.M.: G. Scott); Tugela/Amatikulu Bank, 17–22 fathoms (N.M.: H. Champion); Durban Bay, shallow dredgings (N.M.: B. Young, R.K.).

Family Psammobiidae

Gari (*Gobraeus*) *burnupi* (Sowerby, 1894) (Fig. 24)

Psammobia burnupi Sowerby, 1894: 375; *idem*, 1897: 22, pl. 6, fig. 30.

Although *Gari burnupi* was described as from 'Natal', no subsequent specimens have been found in South African waters, save for a single juvenile (N.M. coll.)

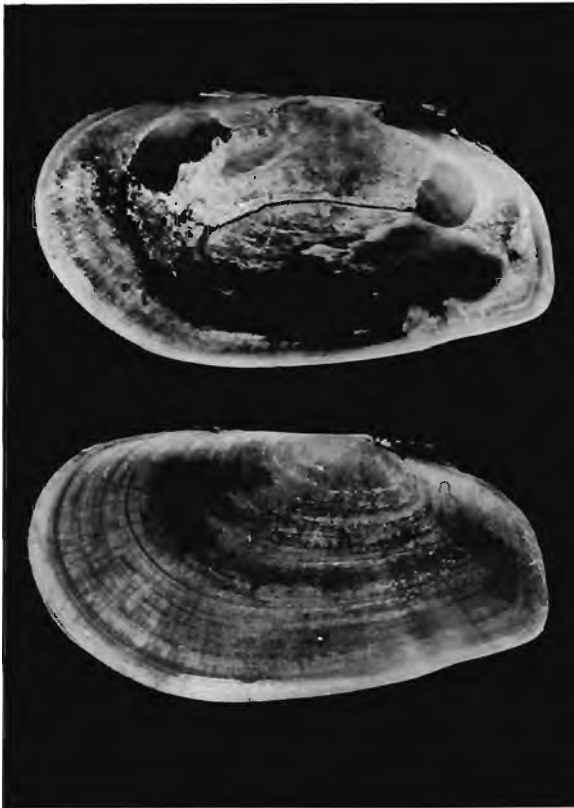


Fig. 24. *Gari burnupi* (Sowerby). Bazaruto I., 21,2 × 1,2 mm.

collected in Durban Bay by H. C. Burnup; this is here designated as the restricted type locality for the species. *G. burnupi* is, however, by no means rare in the Bazaruto Archipelago (Moçambique); there are specimens in the N.M. from the sandbanks south of Bazaruto Island, from the sandbanks between Santa Carolina Island and the mainland, and a single valve from Mucoque on the mainland (all leg. Mrs E. Roscoe).

G. burnupi is abundantly characterized by its very compressed telliniform shape, depressed umbones which are situated decidedly posterior to the middle, low pallial sinus which almost reaches the anterior adductor muscle scar and is partially confluent with the pallial line, and sombre overall purplish-brown coloration. Apart from very fine and close concentric striae, there are minute scratch-like radial striae, widely spaced and irregular over most of the surface, but close and distinct posteriorly. Left valve with a bifid, cuneiform anterior cardinal and a weaker lamelliform posterior one, right valve with two subequal cuneiform cardinals, lateral lamellae indistinct.

Family Thraciidae

Thracia anchoralis sp. nov. (Fig. 25)

Diagnosis: Ovate-quadrate, broadly truncate behind, without an umbonal ridge; surface minutely shagreened, later part of shell with traces of feeble concentric folds.

Description: Right valve larger than left, and overlapping it ventrally, posterior end narrowly gaping. Shape ovate-quadrate umbo rather low, slightly posterior to mid-line, anterior dorsal margin convexly declivous, anterior end sharply rounded, ventral margin gently curved, rather sinuous, posterior dorsal margin flatly declivous, posterior end rather broadly truncate, but hardly rostrate; there is no discernible umbonal ridge. Surface microscopically shagreened; growth lines coarse, developed into very weak, irregular concentric folds on later part of shell. Pallial sinus deep, extending to below umbo, end evenly rounded. Hinge edentulous, ligament in an external groove, chondrophore very narrow and shallow. Shell white throughout.

Dimensions: $23 \times 15,1$ mm (right valve), inflation (both valves together) 9,2 mm (holotype).

Distribution: Known only from the type locality, a sandspit between Santa Carolina Island and the mainland (about $21^{\circ}37'S$, $35^{\circ}19'E$), known locally as 'Anchor Sandbank'. The holotype is an empty shell, but was found *in situ* among a mass of worm tubes at about low spring tide level.

Type material: Holotype (N.M. G2712/T1857), an articulated shell.

Remarks: *Thracia anchoralis* is very close in form to *T. salsettensis* Melvill, 1893, a large (52 mm) species from Bombay, which differs in its flattened left valve, which furthermore shows a median radial depression. Other Indo-Pacific *Thracia* species with truncated posterior ends such as *imperfecta* (Lamarck, 1818), from the Red Sea, *adenensis* Melvill, 1898, from Aden, and *granulosa* Adams & Reeve, 1859, from the Western Pacific, all show a distinct umbonal ridge.

A second undescribed *Thracia* occurs in Moçambique (and Natal), but unfortunately only left valves are at present available. This species, erroneously recorded from Inhaca by Boshoff (1965: 197) as the Cape *Thracia capensis* Sowerby, 1889, differs from *anchoralis* in its more compressed and more oblong form, its thicker hinge, and its more widely rounded pallial sinus.

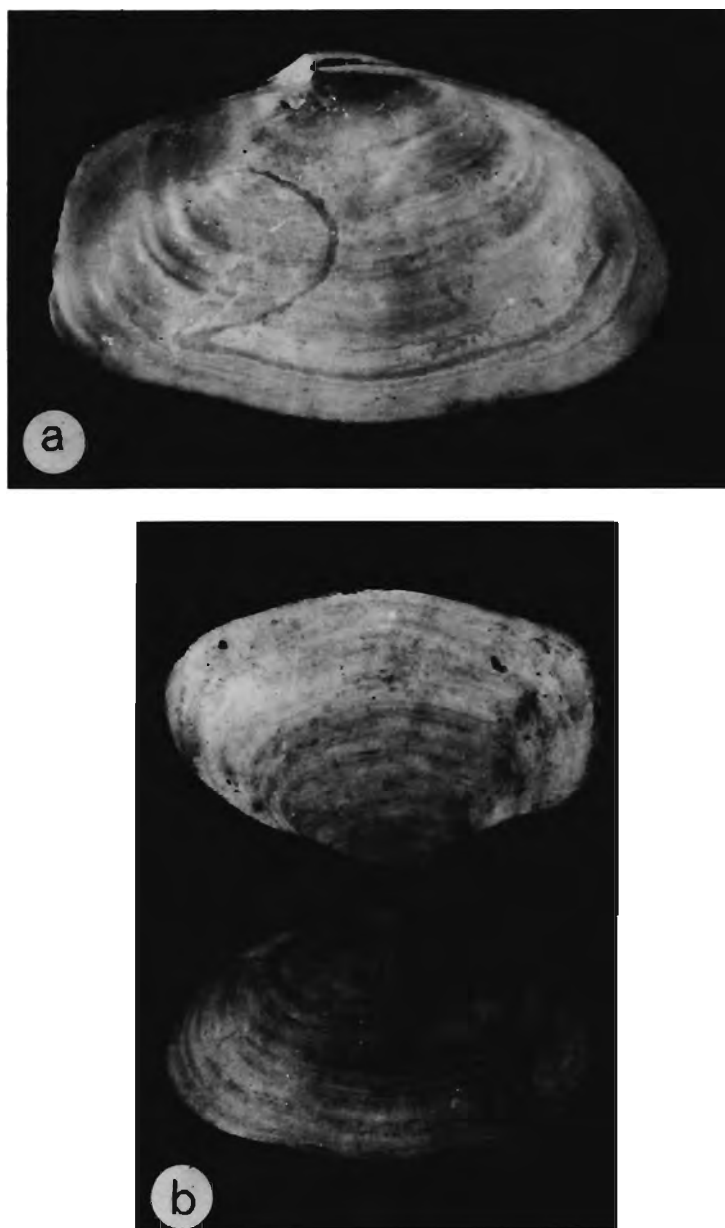


Fig. 25. *Thracia anchoralis* sp. nov. Holotype, $23 \times 15,1$ mm.
a, Interior of left valve. b, Exterior of both valves.

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